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LOGGING RAILROADS
OF THE WEST



LOGGING RAILROADS OF THE WEST

BY

KRAMER A. ADAMS



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INTRODUCTION

The highball signal was two blasts of the steam locomotive whistle. For half a century, it was the most important sound in the West.

Assaulting the stillness of the noblest forests on earth, it gave its name to an entire era of frenzied activity in the lumber industry. The whistle signalled the progress of Man's battle against America's last timbered wilderness. The fortunes of men and cities were based on its vaporous promise, and it heralded the course of empire.

The falsetto of the whistle was part of a deafening chorus made up of clanging machinery, restless steam and groaning wheels. The log-hauling locomotive which carried these improbable noises to the forest was usually a smoky, dangerous and unkempt collection of steel and wood parts which should have been left on the rip track long ago.

She was a lovable woods tramp called something like "Betsy," "The Amazon" or "The Coffee Grinder." Any other civilities directed her way were inspired solely by log-hauling ability, not speed or appearance. Often, she was scorned as a caricature of the coldly efficient engines on the nearby passenger lines. Yet without her, the development of the West would have been delayed and the story of the timber industry a little less colorful.

In daring attacks on the slopes of the Sierras, Bitterroots, Cascades and Rockies, the steam pot chugged into history's most difficult logging terrain. Where railroads had been unthinkable, she ventured boldly on slippery, third-hand rails. If the track wasn't level, it was shimmed up with wood slabs from the lumber mill.

Across creaking wooden trestles and up grades no mainline engineer would attempt, she brought loaded log cars down to the mill day and night, the red hot glow of their screeching wheels visible a mile away in the dark.

Curves were so sharp that the factories of Baldwin, Heisler, Davenport and a dozen others were hard put to produce powerful engines that would stay on the logger's tracks. Lumber, logs, iron and steel were used for rails and the gauge was somewhere between 21 inches and 9 feet.

In her nine decades, the logging locomotive proved that there was no place too remote—no terrain unconquerable—no virgin forest safe. Across desert and swamp, water, snow and ice, she pursued the timber.

The logger properly called her a locomotive instead of an engine, to avoid confusion with other machinery used in the business of getting logs. To him, the locomotive was the center of life. She bore him to

work in the woods and brought out the hot mid-day meal. At times the homeward-bound crew car was a refuge from the bitter weather by which Nature fought back at the bold men who presumed to hack away at the biggest plants on earth.

The logger ate and slept on the rails in camp cars that were shuttled from place to place. The downhill tracks beckoned on payday and took him closer to the city skid road where the rigors of woods life could be drowned out in an orgy as lasting as his hard-earned wages.

The tracks of the logging road led from the timber cutting site to the nearest mill, log pond or booming grounds. The railroad operator's mission was to deliver the logs down the hill as quickly and cheaply as possible.

In the attempt, an unbelievable assortment of obstacles was placed in the way by Man and Nature. Slides, floods, earthquakes, storms, fire, snow and rain dealt terrible blows to the logger's flimsy efforts to span the forest. Derailments, wrecks and explosions made railroad logging one of the most dangerous of all occupations. Among other hazards were wandering bears, deer, elk and cattle on the right of way. Indians fired on the log trains and dynamite on the tracks was used by unfriendly strikers to drive home a point.

More often it was disaster of a financial nature which stalked the railroad show. Anyone with a few hundred dollars and access to timber could make a down payment on a used locomotive and start his chance. Some succeeded in the gamble, but many more lost, and the locomotive was destined to change hands again. Smarter operators ran their trains across the county line to avoid the sheriff. On other occasions, the transfer of ownership was accomplished in a poker game.

There were 3,000 locomotives used on as many railroads which came and went in the tumultuous first century of Western logging. Most of them were ugly, noisy and certainly not the ladies they were built to be.

She might once have been the pampered queen of a mainline, but now she snorted through the forest on a diet of wood, coke, coal, kerosene, oil, briquettes, electricity, gasoline or borrowed steam—whichever was cheapest. Water for her boiler often came from the handiest creek.

In form, the locomotive was as varied as her duties. She was a sleek new product of the Baldwin Works, a converted gasoline truck

or a remodeled threshing machine. In the early days, she might have been a homemade rig, constructed mainly of logger's ingenuity and kept together by baling wire. In no other type of service was there such a variety of motive power.

Only superlatives can be employed to describe the 90-year pageant that was Western railroad logging. There was the shortest railroad in the world, and the steepest one. Logging roads claimed the most expensive mile in history, the highest wooden trestle and the broadest track gauge. There was the longest and steepest incline railroad, the curviest right of way and the oldest regularly operating locomotive.

Amidst the most beautiful scenery in the Nation, the western logging railroads wound over stumps and through the trees on the most dangerous steel pathways that ever existed.

Train schedules were set by the sun, the tide, the barometer or smoke signals from another locomotive on the track. Trains ran a reputed 30 hours each day in and out of such mill towns as Six Bit Gulch, Calif., Remote, Ore., Pysht, Wash. and Big Blackfoot, Mont.

Many of the log-haulers were common carriers, whose passenger trains never sold a ticket; indeed, did not have tickets to sell. Others carried presidents and kings, movie stars and tramps into the grandest forests on earth.

The loggers called them by such titles as the "Stump Dodger," "Knothole Central," "Old Slow and Easy" and "The Skunk Line." Like most nicknames, the unflattering terms were born of familiarity and used with affection.

Few remain to mourn the highball days. The wasteful cut-out and get-out logging which the railroad made possible has been replaced by reason in the handling of America's forests. Sentimentalists alone will care that the steam locomotive has already made her last spur run and exists today as a curiosity on a dwindling few main line hauls.

For those who prefer to remember, and for the curious of the future, these notes on the steam-powered railroads which hauled logs for a living were gathered in the hope that it wasn't too late. The story is restricted to the 11 Western states, where a combination of awesome terrain and forests of magnificent proportions challenged the railroad logger, and where his ingenious, heroic and sometimes comic methods of overcoming Nature are most worthy of record.

TACOMA, WASHINGTON

KRAMER A. ADAMS

Table Of Contents

Chapter 1	WHISTLE IN THE WOODS.....	Page 11
Chapter 2	THE UNCOMMON CARRIER.....	Page 21
Chapter 3	THE SCENERY INSPECTORS.....	Page 41
Chapter 4	PUSHING STEEL	Page 47
Chapter 5	THE UP AND DOWN RAILROADS.....	Page 57
Chapter 6	TRACKS TO THE TIMBER.....	Page 63
Chapter 7	HOGS AND IRON OXEN.....	Page 71
Chapter 8	JOINING THE BIRDS.....	Page 111
Chapter 9	THE SLOW BELL.....	Page 123
	WHISTLE SIGNALS.....	Page 137
	THE LAST OF THE STEAM LOCOMOTIVES.....	Page 138
	GLOSSARY AND ENGLISH-LOGGERS DICTIONARY.....	Page 140
	BIBLIOGRAPHY AND REFERENCES.....	Page 142
	APPENDIX — LISTING OF LOGGING RAILROADS OF THE WEST.....	Page 144



WHISTLE IN THE WOODS

The trees were so tall that it took Paul Bunyan two days to see to the tops. He looked as far as he could in one day and started from that point the next morning.

Even the loggers' legendary patron had never faced such a challenge: to conquer the trees of the West and put them to Man's use.

Nowhere on earth did the softwoods grow so high, so big or so close together. And nowhere else did a whimsical Nature combine such tempting treasure with such formidable obstacles.

The loggers who drifted in from the East during the Nineteenth Century were astonished at the size of the trees before them. The land they grew on presented awesome logging problems and prospective markets for the produce were remote. To remove the green gold of the West would require new measures and new equipment.

It was a task for which the logger had been in training for nearly a century. He had developed the basic techniques among the hardwoods of the Northeast. The challenges of the Southern pineries had been met and conquered. The skills of transforming trees to useful products were being tempered in the Lake States with devastating efficiency.

Paul Bunyan took the giant stride across the prairies and hesitated. The timber was there, but how to secure it?

Since the West's first lumber mills budded in the 1830's and 1840's, the handiest trees had been directed to the saws by either gravity or water. Technological achievement was symbolized by the use of horses and oxen to drag the logs, or an occasional chute which guided careening logs down the hillsides to the mill. Rivers, lakes and bays were the easiest means of transporting logs, but shoreline tree supplies wouldn't last forever.

The exact point at which a steam locomotive was first applied to the chore of hauling logs

has become obscured by time. George L. Colwell of Steuben City, New York, claimed that it was he who had first done so, in the 1850's. At any rate, it was an inspired formula that dictated the history of lumbering in the century that followed.

The rails were slow in reaching the Western forests. Where 71 logging railroads flowered in Michigan alone shortly after the end of the Civil War, not one was to be found in all the Western states and territories.

The delay was economic. The large capital investment of a railroad was practical only on large logging operations. Large operations had to be backed up by large mills and large markets. Neither existed in the sparsely settled West until the transcontinental railroads arrived. They opened the swinging door which brought in new settlers and permitted local produce to reach the East.

As early as 1852, operators of tidewater mills along the California coast had been using primitive railroads to bring logs short distances to the mill. Some of the cars on these wooden-tracked tramways rolled by gravity, while others employed horses or oxen. *Humboldt Times* in 1854 reported more than 20 miles of such lines around Eureka.

Significantly, the first steam logging railroad in the West was created to serve the needs of a transcontinental mainline railroad. The year was 1868, and railroad fever was on the land. Union Pacific Railroad was rushing its construction westward to join with Central Pacific crews working toward the east. One of the links in the nation's first transcontinental rail system was Denver Pacific Railroad, a subsidiary of UP.

The pressured Denver Pacific couldn't obtain ties and timbers fast enough for its difficult construction work through the Rockies. Perhaps it was a harried official of DP who suggested to local loggers that they adapt a railroad to the

task. At any rate, *Daily Colorado Tribune* early in 1868 reported that Arapahoe, Jefferson & South Park Railway Co. had just been incorporated and its owners were debating whether to use horses or a locomotive for power. Steam won out, and the line was soon hauling timber from Bergen's Ranch to Denver.

The short-lived operation proved a financial failure, but it had brought the revolution closer to the storehouses of Western timber.

Three years passed before the idea of combining steam and rails jumped the Rockies and reached the Pacific Coast. In 1871, *West Coast Signal* announced that Smith & Dougherty had closed down their mill to build a railroad into the redwoods near California's Trinidad Head.

The advantages offered by steam power were soon being explored by other loggers on the Coast. Gualala Mill Co. was operating a wood-burning locomotive in 1872. John Vance's Humboldt Bay & Mad River Railroad chugged into the picture in 1874, besting by a year the nearby South Bay Railroad and Noah Falk's line.

At the beginning, the pioneer logging lines were merely substitutes for water. The concept of railroad logging hadn't yet moved out of the streambeds, and the wooden rails and end-to-end poles crept hesitantly along the path of least resistance. They were expedients to relieve the logger from his reliance on the vagaries of water transport.

By 1880, nearly two dozen lines were clawing into the timber of the coastal states. In 1883, California's Humboldt County alone could account for five separate logging roads, with two more a-building.

The earliest logging railroads were usually run by the operators of lumber mills who needed a dependable supply of logs. Later, a distinct

REDWOOD LOG on a pair of detached trucks weighed 30 tons and contained enough wood to build a house. Scene at Scotia in the '90's on The Pacific Lumber Co. line.





CLIFF-HANGER TRESTLE above the Pacific was used by L. E. White Lumber Co. at Greenwood in the '90's. Locomotive Number 1, a narrow-gauge 4-4-0, was built by Baldwin for North Pacific Coast Railroad in 1874.

separation of the logging and milling businesses took place, with the logging operator frequently supplying the millman under contract. In many cases, the logging company was a subsidiary of the lumber company. Throughout the rail logging era, about half the lines remained under the ownership or control of lumber manufacturing companies.

The advent of the logging railroad was opportune. Things were looking up in the 1880's. In a decade comparatively free of financial panics, the West was in for its first substantial boom since the Gold Rush.

Like a good fairy's magic wand, the mainline rails touched the land and brought it to life. Montana had its first railroad in 1880. A year later the rails pierced Southern California. The direct route from California to New Orleans and from the Great Lakes to Washington Territory opened in 1883. Oregon and Chicago were joined in 1884. Seattle and San Diego became terminals of the coastal rail link in 1887.

The coming of the overland rails vitalized the Western lumber industry. The thousands of settlers who poured in needed lumber for housing. So did the businessmen and agriculturists who served them. Aside from the booming local demand, the lumber companies found

that their export trade was no longer limited to the small holds of the coastal sailing schooners. The lumber market place was now 3,000 miles wide and Texas deep.

Out in the woods, the stepped-up demand for timber brought gradual improvements in logging techniques.

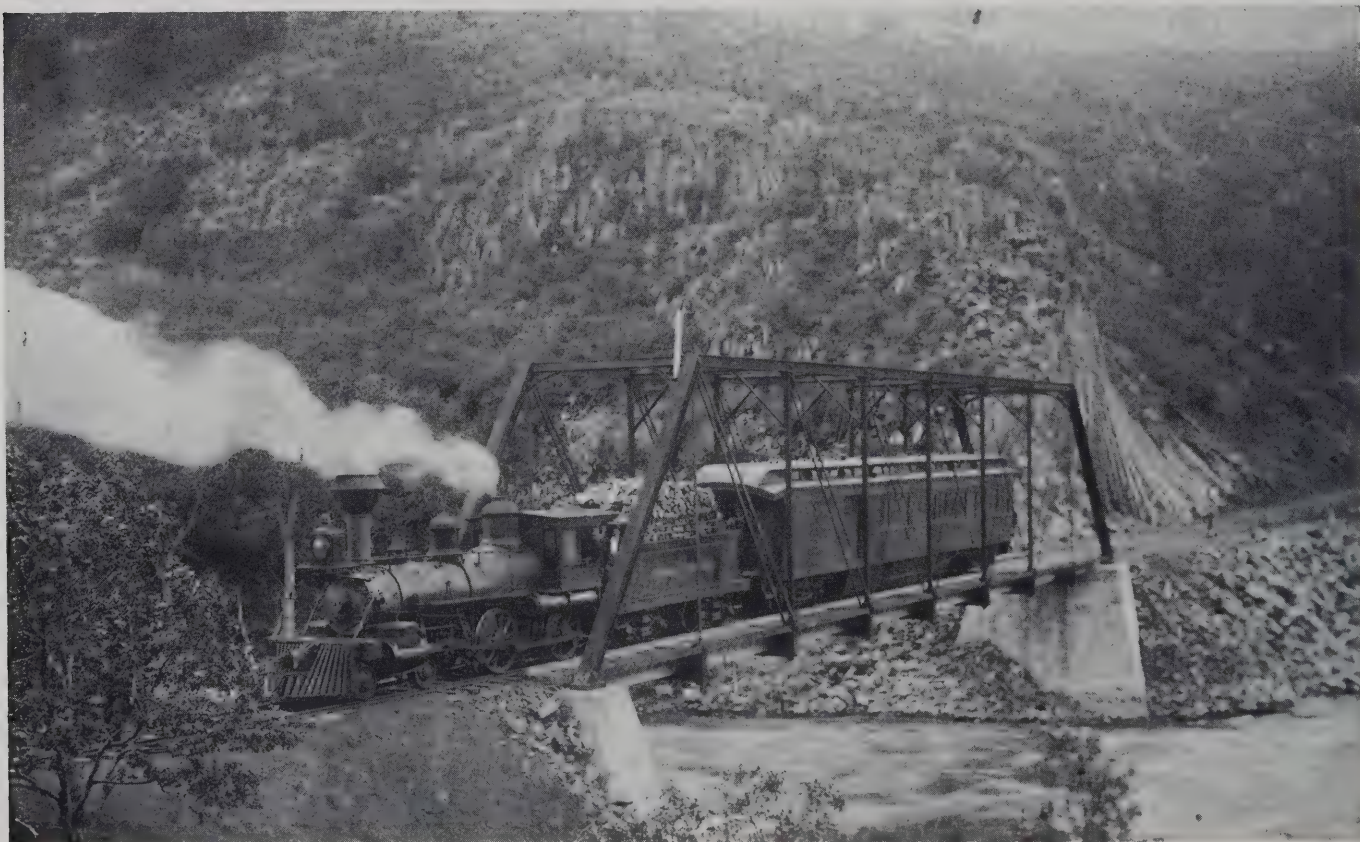
One of the earliest problems faced by the logger was that of loading the logs on railroad cars. Some of these tree sections came to the railhead weighing more than the locomotive and were sometimes wider.

With only oxen, horses or a puny little locomotive at his disposal, the logger fell back once again on Nature. He built his railroad tracks below the point where the skid road ended, letting gravity roll the logs onto cars.

The skid road was the pathway down which logs were dragged from the felling site by animals. Its lower terminal was known as the landing. It was common in the last century to implant a series of logs cross-wise to the incoming logs to ease the move to the cars. This type of landing was called a rollway.

With the advent of the steam donkey engine in the 1880's, the chore of handling logs became considerably easier. The donkey—so named because it was purportedly unworthy of being

PASSENGERS on Weyerhaeuser's Oregon Southern Railroad were more often found in the cab chatting with the engineer than in their coach. American-type locomotive is a Rhode Island product photographed at the Klamath River bridge in 1907.





COMBINATION TURN of trails and cars used by Bridal Veil Lumbering Co. in the '90's.

(Ore. Historical Society)

rated in horsepower — was patented by John Dolbeer of Eureka in 1882. A man who later became president of Caspar Lumber Co. steadfastly claimed that it was he—not Dolbeer—who invented the donkey. But the patent was proof enough to the logging fraternity and the portable engine became known as the Dolbeer donkey.

The donkey engine was first used in unloading logs at the mill pond. Soon it was out in the woods pulling logs to the landings. A later development was the “roader” donkey, which took over the skid road duties of animals and gravity.

A year after his development of the donkey, Dolbeer attached the versatile piece of machinery to the pilot of a locomotive. The combination of log-handling machinery and locomotive was dubbed a “gypsy.” Now the locomotive’s steam boiler could be applied to yarding logs from the tree stump to the rails.

The gypsy-rigged locomotive found limited favor almost exclusively in the Redwood region, although the last example of Dolbeer’s invention was used in the pine forests of Oregon in World War II.

On some operations, the locomotive was em-

ployed in the log-loading process. Using a block and tackle arrangement, wire rope was passed under the logs and attached to the pilot of the locomotive. When the cable was pulled, the logs were par-buckled onto the cars.

At the other end of the railroad line, the problem of unloading the log cars was considerably simpler. Usually the logs would cascade into the mill pond of their own weight after the holding stakes, blocks or chains were removed. A canted track helped the process. Sometimes hand-operated jacks were employed to inch the logs off the cars toward the water.

Many loggers decided to dispense with the bothersome refinements of loading and unloading and merely trailed the logs between the rails behind the locomotive. Skid grease, planking and notched ties were sometimes used to ease the journey of the trailed logs, which were usually snubbed at the leading end.

Gradually the donkey engine became more powerful. Primitive gin poles were replaced by powered booms and spar trees. Progressively larger steam engines on log skids or rail cars took over the skidding, yarding and loading of

logs. By 1906, the production of logging engines was the largest branch of machinery manufacturing on the West Coast.

For the two decades of railroad logging that took place before the coming of effective geared locomotives, the logging operator struggled with underpowered industrial locomotives, high wheeled castoffs from mainline passenger service or home-made monstrosities. Except under the ideal conditions of a few candy shows, the limitation of available locomotive power wouldn't permit much flexibility at the woods end of the line. The logging railroad remained the equivalent of a mechanical river which hauled instead of floated logs to the mill.

It took many years for the classic pattern of railroad logging to evolve. As locomotives developed more tractive power and improved woods machinery freed the railroad lines from the limitations of fixed landings, the trains moved out to where the trees were being felled. Gradually the sound of the locomotive steam whistle penetrated the deep woods.

The logging railroad system which evolved might best be likened to the trees which brought

it into being. It was a collection of branches which fed by gravity into a main stem or trunk.

In logging, the branches were called spurs and the trunk the main line.

Spurs were considered temporary. As soon as the surrounding timber was cut, the spur would be abandoned or picked up and moved elsewhere.

The main line was the permanent part of the operation; the trunk of the system. It was the prime course of the logs moving between woods and mill.

By the mid-'80's, all the elements for efficient removal of the West's timber treasure had been assembled. The mainline railroads had created new markets for lumber locally as well as across the country; the donkey engine was available for handling logs in the woods; and the manufacturers of locomotives had recognized the Western logger's needs by providing more suitable power.

The stage was set for the greatest harvest of timber the world has ever known. The highball days were beginning.

BOOMING GROUND on salt water was the usual destination of the West's earliest logging railroads. Mills were located at tidewater to service the cargo lumber trade. This trestle at Tarheel, near Coos Bay, was used by Simpson Lumber Co. in the last century. (Jack's Photo Shop, Coos Bay)





REDWOOD LOGS WORTH a small fortune even in 1891 are hauled to the Eureka mill by Number 3 Baldwin of Excelsior Redwood Co. The first log behind the locomotive had a diameter of 11 feet, 9 inches.

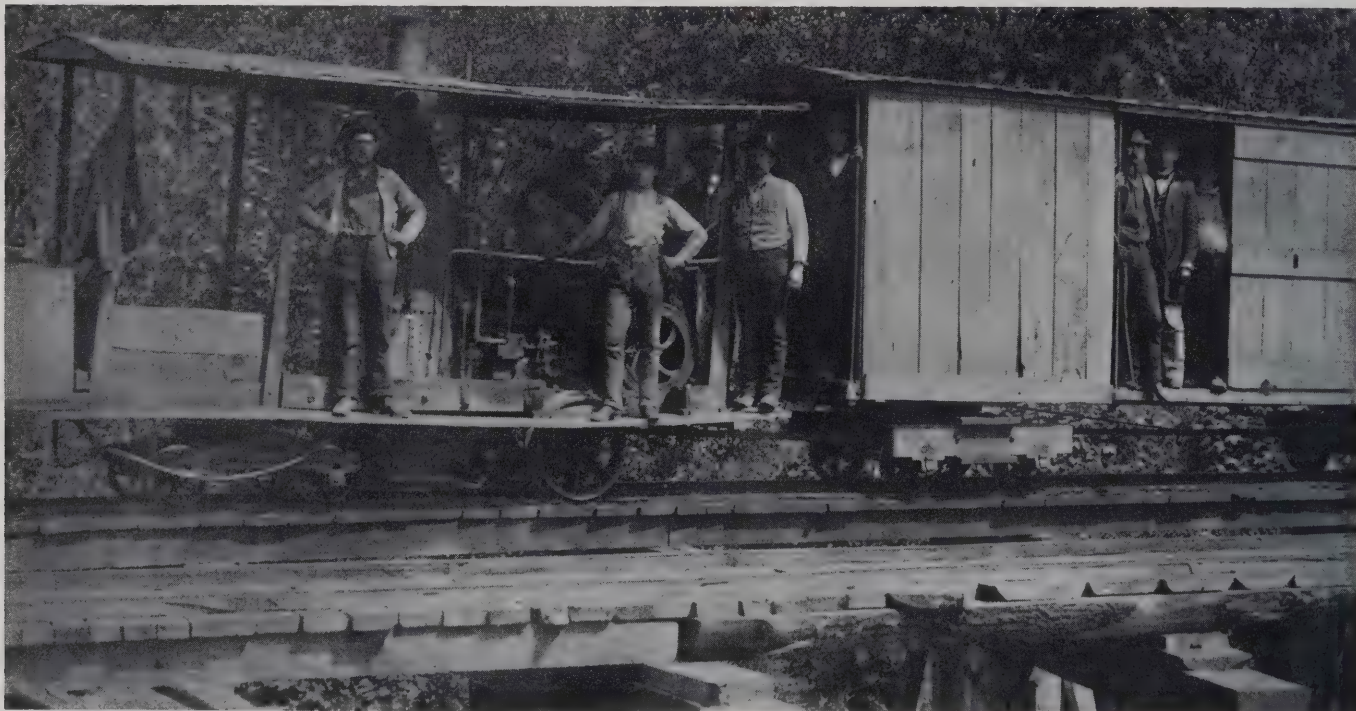


POLE ROAD CARS, powered by animals or gravity, represented the latest in woods technology in the mid-1800's. Tom Dollard, left, mans a jackscrew to dump a log at the Mendocino County camp of Jim Nichols in 1875.



TWO-HORSEPOWER RAILROAD was typical of dozens which flourished along the Pacific Coast in the mid-Nineteenth Century. With the rising demand for logs, steam-powered locomotives began to supplant horses, mules and oxen in the Seventies.

EARLIEST STEAM LOCOMOTIVES in the Western woods were often home-made flatcar conversions with an upright boiler. Photo shows first engine of Oregon's Isthmus Railway, built in the mid-Seventies to haul logs, coal, freight and passengers. (Jack's Photo Shop, Coos Bay)





NEWLY ACQUIRED CLIMAX locomotive was reason enough to roll out all the power of Yeon & Pelton Co. for the photographer. When this photo was taken in 1903, the line's rails were spaced 42 inches apart, a distance universally referred to as "bastard gauge."
(Ore. Historical Society)

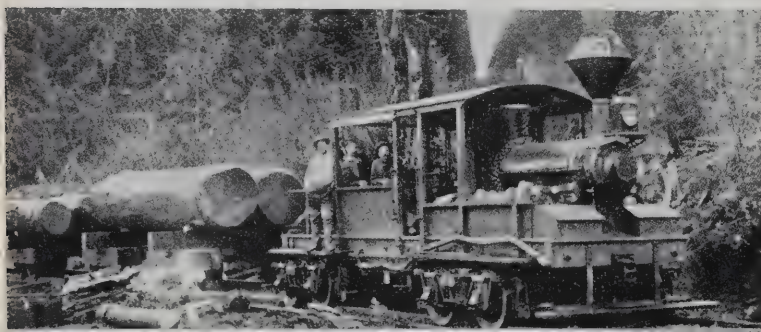
DONKEY ENGINE on wheels best describes this homemade logging locomotive of the 1880's.





LOCOMOTIVE ROSTER of Sierra Nevada Wood & Lumber Co. in 1898 included a pair of 1875 model Baldwins destined for greater things. Number 5, in center, was acquired by Warner Bros. Pictures and has been seen in numerous movies and television productions. Number 3, second from right, appeared in the movie "Union Pacific," among others, and is to be exhibited in the San Francisco Bay Area by the Railway & Locomotive Historical Society. (Calif. Historical Society)

WOODEN RAILS were tried by C. C. Masten with his brand new 1898 model Climax locomotive. In spite of slip-proof corrugations built into the flanged wheels, the wooden rails proved troublesome and were soon replaced with iron.



THE UNCOMMON CARRIERS

It was an age of rugged individualism, and in the public mind, the timber baron ranked only a notch below the railroad baron as a symbol of the times. All other barons of commerce, whether of oil, shipping, agriculture, banking, mining or cattle, were comparatively free of the muckraker's wrath because their activities were less exposed to the casual observer.

Portraying the rugged individualist was a role the logging operator enjoyed. More importantly, it was essential to his survival in the rough-and-tumble days of Western lumbering.

"The calling of the logger produces big men, robust, daring and bold," was the way Timberman George S. Long put it when addressing a pioneer session of the Pacific Logging Congress.

Had not the diplomatic Mr. Long been facing a group of loggers, he might well have included in his description such adjectives as "independent," "impatient" and "stubborn."

All such qualities were environmental products of the times which became nowhere more evident than in the logger's railroads. The tracks were the backbone of his operations, and there'd be no funny business tolerated at either end of the line or in between.

This attitude brought the logger into occasional conflict with the government, the public and other timbermen. But over the decades, he was more often engaged in battle with the nearest mainline railroad company.

The logger was obliged to do some kind of business with the likes of Santa Fe, Union Pacific and Great Northern, and the dealings were not always friendly. Some operators had to rely on the mainlines for all or part of their rail haul to the mill. Others rented log cars, locomotives or rail from the big companies. Machinery and supplies needed in the logging business were usually routed over public service tracks. And a large number of operators dealt with the transcontinentals in shipping lumber.

From the beginnings of the Western lumber industry, there had been a running battle between timbermen and railroad men over freight rates, demurrage, in-transit selling, rights of way and car shortages. It was to have a strong influence on the history of logging railroads.

Some of the timbermen reacted to the shabby treatment, real or imagined, that they received at the hands of the big companies by building their own common carrier railroads.

Among the dissidents were the Schafer brothers, who didn't like the rates charged by Northern Pacific for hauling logs to their Aberdeen mill. They set out to build their own line, but were refused permission to build a grade crossing over N.P.'s tracks. Quietly, the loggers mortgaged their business for \$10,000 and built a portable sawmill at Brady. It was soon turning out a large volume of timbers and planks. As none of the output was being shipped over N.P., an uneasy curiosity developed among the railroad officials. The suspense ended several months later when a large, ugly structure began to take form high over the N.P. tracks. It was a long overpass, built from lumber produced by the portable mill. Over it, Schafer Bros. log trains were soon shuttling to Aberdeen on tracks parallel to N.P.'s.

A similar reaction occurred when mainline railroads refused to build a line to serve the new Idaho mill of Potlatch Lumber Co. The enterprising lumbermen took matters into their own hands and built a 50-mile long independent railroad that thrives today as the Washington, Idaho & Montana.

Great Northern and Union Pacific told Long-Bell Lumber Co. that their log trains were not welcome on the mainline tracks because a spill might block the tunnels. Long Bell's rebuttal was to build the six-million-dollar Longview, Portland and Northern Railway, which today operates three divisions in two states.



ARCATA & MAD RIVER Railroad's Number 2 led a double life. After hauling redwood logs to the mill, the immaculate little wood-burner was put to work on the passenger run. Engineer and conductor wear uniform hats in this scene of the late '80's. (Calif. Historical Society)

The tables were turned in the case of the log-hauling road of Elk River Lumber Co.. Its rails had been on the ground since 1884 and established priority over a mainline company that wanted permission to cross. There were some heated conferences, followed by grudging permission to the mainliner to make a grade crossing. But the loggers had driven a hard bargain. Aside from financial considerations, they insisted that every mainline train come to a complete stop and salute the logging road crossing with a blast of its whistle.

While revenge against the mainlines was a tempting reason for some loggers to enter the railroad business, it was overshadowed by other advantages. There was much to gain by converting a logging railroad to a public service corporation—or at least representing it as such. The reward could be in the form of profits, power or prestige. In some cases, the very existence of the logging road depended on its legal status as a common carrier.

To the railroad logger, the most useful bonus was the authority to condemn rights of way.

As an avowed public carrier, he had as much right as any railroad to secure land for his roadstead.

More than a few Western logging roads suddenly decided to become public service corporations when their planned courses ran into uncooperative landowners. If the logger didn't own all the land through which his tracks were to be laid, he had to make arrangements with other owners. If the landowner didn't want to sell, or his price was too high, the matter could be adjudicated in the courts only if the railroad in question was a common carrier.

This brought up the matter of "proper compensation," which often proved burdensome for the logger. In one case which went to court in 1909, witnesses valued the property in question all the way from \$15,000 to \$1,000,000. The court, by a reasoning which was never revealed, came up with a strange compromise award of \$99,000.

Most of the time, landowners recognized the benefits that would come with a nearby railroad—common carrier or not—and accepted the logger's right-of-way offer. Such payments averaged \$10,000 a mile for a number of years, although a few landowners were pleased to donate their land for right of way purposes.

One of the friendlier arrangements was negotiated by Simon Benson, a pioneer railroad logger on the Columbia River. For permission to allow the log trains to pass over his property, one cooperative homesteader settled for a fee of \$25 a year. As cash was scarce around Cathlamet in the 1890's, Benson made the annual payment in cordwood, as agreed.

At nearby Oak Point, the Weists fared less well in their right of way dealings. A stubborn landowner had blocked their plans for a short, straight track down a creek to the Columbia. In desperation, they built a skid road to the top of the hill behind the disputed property and installed a machine hoist. One by one, logs were taken off the cars and dragged up the hill. At the top, they were placed on a chute which dropped them into the river.

The Lewis brothers, who operated a sawmill in California's Sardine Valley in 1897, anticipated trouble from the many landowners who would have to be solicited for easement. Their solution was a novel one for the times, but would today be labeled a smart public relations gesture.

One memorable Sunday, everyone with ear-shot of the locomotive's whistle was invited to

the Lewis' picnic. There were the customary games, food and drink. Then came the clincher. The mountain dwellers were treated to a free ride on railroad flatcars. The neighborly overture paid off and road construction proceeded without a hitch.

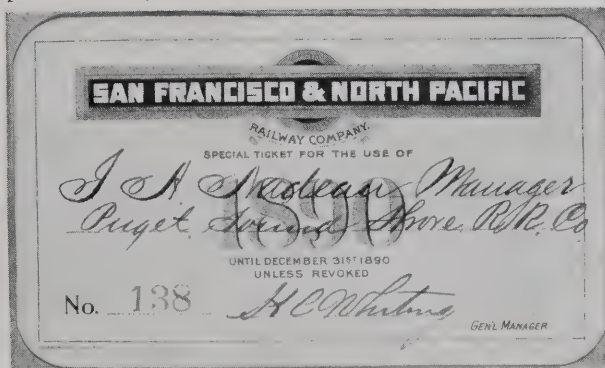
One landowner on Rocky Mountain Railway's right of way never was convinced that cattle guards were better than fences. As a result, every train that passed through the Switzer Ranch for 14 years was required to stop twice while the conductor opened and closed the gates.

On occasion the common carrier was used by the logger to hold economic sway over large areas of timberland. By establishing a public carrier, and operator could sometimes keep out competitive logging lines, which were denied the right of eminent domain. With a local monopoly on the transport of mill-bound logs, the shrewd operator was in a position to make favorable deals with nearby landowners.

Leudinghaus Brothers discovered this too late. Both they and Meskill Lumber Co. had their eyes on a strategic canyon pass in the mountainous terrain of western Washington. The land was owned by Leudinghaus, but Meskill quietly formed a common carrier railroad company and started condemnation proceedings.



COURTESY PASSES WERE freely exchanged among common carrier railroads. Operators of some small logging lines received reciprocal privileges from practically all the railroads in the country simply by mailing out a flood of passes each year.



Leudinghaus appealed in the courts, claiming that the canyon was too narrow for two railroads and that the access was vital to Leudinghaus operations. It was, but Lewis County Superior Court had no choice but to give Meskill & Columbia River Railway Co. a 60-foot right of way over Leudinghaus land. The decision had much to do with the merger of the two firms a few years later.

One unusual reason for converting a logging road to a common carrier was never publicly admitted by a Weyerhaeuser-affiliated line in Idaho. Under a 1903 law, saloons were prohibited within five miles of any "public works." It was charged that, by declaring as a public service corporation, the straight-laced management had a five-mile head start in keeping its thirsty employees sober.

For four or five decades, there was much confusion surrounding the status of logging roads as common carriers. Across the country, hundreds of suits tested the various laws and regulations of state and federal agencies.

The logger's problem was typified in the State of Washington, where an early Territorial law permitted railroads to condemn a right of way strip 60 feet wide and up to 200 feet where required. The Right of Way Act of 1899 cleared up earlier doubts by granting eminent domain privileges specifically to logging companies. But in 1904, the state supreme court ruled against Black Hills & Northwestern Railway, and threw out the Act of 1899. The Legislature in 1905 came up with the Toll Logging Roads Act, which straightened out the matter to the general satisfaction of loggers. A 1911 court decision in the case of Port Crescent Timber Transportation Co. clouded the issue once again, and law suits of various types began to appear on the dockets.

The logger's problem under the confusing welter of decisions and counter-decisions was touchingly reflected in a poem published by *West Coast Lumberman*:

But when he lieth down at last
And Gabriel blows his long, long blast
May he arise from the cold clay
And find to Heaven a right of way.

The questions to be decided by the courts usually amounted to a few thorny basics: did a logging road have to serve the public in order to gain the power of condemnation; was the railroad owned by a lumber or logging company entitled to the freight rate-sharing advantages of a common carrier; did the lower tax rates

granted to a quasi-public service corporation apply to the logger's common carriers; if the logging road received all the other advantages of a common carrier, did it have to comply with the regulations issued by the state railroad commissions and the Interstate Commerce Commission concerning such things as safety, wages and hours; and could a logging road be compelled to act as a common carrier when it controlled a vital right of way.

In some states, the era of railroad logging came and went without clear-cut official rulings for all the questions.

The famous tap lines decision of the U.S. Supreme Court in 1914 had a stabilizing influence on several of the basic issues. Over-ruling the Interstate Commerce Commission, it held that even if a railroad was owned by a logging or lumber company, it was entitled to the rights enjoyed by other railroad companies. The decision cleared up a number of suits then in the lower courts, most of which had been instigated by the big mainline railroads.

The large number of Western timber operators who dabbled in politics had a strong influence on laws favoring the small common carriers.

"Logger Joe Irving got himself elected to the Legislature," reported *The Timberman*, "and successfully pushed through the bill which broke the shackles of the right of way hog."

With or without laws, the chore of obtaining rights of way was often the most difficult part of building a railroad.

The alternative to a satisfactory right of way was what came to be called the "ram's horn route," a devious course which side-stepped the property of hold-out landowners.

An expensive demonstration of the lengths to which a determined logger would go occurred in Humboldt County in 1891. Occidental Mill Co. had a six-mile logging road which passed through the property of C. W. Hill. When Hill became involved in a dispute with the company concerning rights of way, he erected a spite fence across the railroad tracks. With no logs coming in over the rails, the mill was forced to shut down.

"This is a contingency the mill has not provided for," reported the contemporary issue of *Pacific Coast Wood and Iron*. Somewhat stronger terms were used to describe the situation by Occidental's Manager, J. J. Loggie.

After several weeks of impasse, Loggie took action. With a work force of 125 men, he started

out to build a one-mile detour around the disputed Hill property. It turned out to be one of the most difficult and expensive miles in railroad history.

Among other obstacles, he had to tunnel through a bluff, build a trestle, make deep cuts and construct a long fill that was 24 feet deep in places. In digging out the tunnel, dirt had to be hauled back up over the top of the hill in order to avoid trespassing on Hill's property. Timbers for the 350-foot tunnel had to be brought in by the same route.

Two months later, a triumphant Loggie was running five trains a day over the detour. Hill's spite fence was still up.

Loggers became familiar with one sure-fire method of settling a right of way disagreement. The railroad crew would lay its tracks over disputed property on a Sunday, when the landowner could not obtain an injunction prohibiting the act. The terms then revolved around the undeniable existence of a railroad, often to the logger's advantage.

It was one of the tools of the early railroad builder, as were cajolery, trickery and force. A classic use of the latter took place in 1903, when the log-hauling Boca & Loyalton was extending its line. For three miles, its tracks ran parallel to the competing Sierra Valleys Railway. To reach a promising new lumber mill north of Beckwith, it would have to cross the SVR line. Understandably, B&L's request was turned down by the rival management.

Before the Sierra Valleys people could get

wind of what was up, B&L had hired an army of 100 men, issued guns, and hauled them to the crossing site. One version of the affair has it that a menacing group of Sierra Valleys partisans showed up, and were soon subdued by the abundance of free beer that the B&L had thoughtfully brought along for such an eventuality. At any rate, it was Sunday, and the SVR tracks were ripped out to make way for the B&L crossing frog.

In the cold, sober and legal light of Monday morning, however, a restraining order was issued by the U. S. Circuit Court. Boca & Loyalton had to replace the torn up track and seek another route to Beckwith.

Another mixup of memorable proportions involved Pacific Lumber Company's California & Northern Railroad versus Eureka & Klamath River Railroad, owned by Dolbeer & Carson and Vance Lumber Co. interests. Both lines held a franchise from the City of Eureka and both had purchased waterfront property there. But there was room for only one railroad track.

The rivals' race to run a line between the Klamath River and Humboldt Bay seemed won by C&N the night that its construction crew slipped into town and laid a track over the narrow bottleneck. The act forced an agreement between the two companies for joint use of the track, but the truce didn't last long. A year later, construction work of Eureka & Klamath River was held up by a C&N charge that the agreement had been broken.

PASSENGERS CAME LAST on the fabled Sumpter Valley Railway, as they did on all logging lines. This photo of the '90's shows Numbers 7 and 5 tackling the 5,000-foot summit with log cars ahead and passenger car trailing.

(Ore. Historical Society)



Countercharges were in the air when a new logger, Del Norte Humboldt Railroad was incorporated, and promptly filed a suit condemning the joint trackage of the other two lines.

The snarl was finally untangled in 1903 when H. E. Huntington, vice president of Southern Pacific, bought Eureka & Klamath River.

Up on the Olympic Peninsula, a man of vision named Norman R. Smith was certain that a railroad would have to be built north from Grays Harbor sooner or later, and its course would surely have to traverse a narrow pass near Lake Crescent.

With the zeal of the visionary, he loaded a pair of sawed-off rails on a pack horse and rode off deep into the wilderness. Choosing a strategic spot on the lake bank, he laid down some log ties and secured the short pair of rails.

Smith had established his right of way claim and now retired to await the fortune that would surely come with the railroad. Time passed and the line came, just as predicted. But it was a log-hauler whose whistles were never heard by Smith. He had died years earlier with only one compensation for his efforts: he had been the owner of the shortest railroad line in the world.

One of the Nation's shortest common carrier

railroads was The Pacific Lumber Company's Eureka & Freshwater Railway. Around 1910, it owned one locomotive and 95/100th of a mile of track.

Like some other logging roads, the E&F had agreements with cooperating companies to run trains over their tracks. There were other cases where the tracks of two or three individual railroad and lumber companies were used by one log-hauler incorporated as a common carrier.

By 1927, the logging railroad had become an established fixture on the Western landscape, and a Weyerhaeuser Timber Co. representative was able to tell that year's Pacific Logging Congress about one successful method of overcoming right of way difficulties.

The company was then opening up its Vail operation, and required an 87-mile railroad between the timber and Puget Sound.

"The most interesting part of the whole construction job was buying the right of way," Lloyd Crosby told the group. "Most logging railroads start right in the timber. Here, we had to cross 30 miles of improved farmland. In addition, we had to have a lot of terminal property on the bay.

"So we made our survey quietly, and after

GAY OCCASION IS OBSERVED in the mid-'80's on Humboldt & Mad River Railroad. Locomotive Number 3, "Onward," was an 1883 model Baldwin. (Calif. Historical Society)





PICNIC EXCURSION TRAIN was a common method of keeping loggers on the reservation for the Fourth of July. Operations might be crippled for days and weeks if woods crews reached town to observe Independence Day in their traditional outburst of patriotic fervor.

getting hold of the key pieces, we came out and told the people we were going to build a railroad. We told them we would be fair with them if they would be fair with us; that we wanted to pay what was right and wanted them to take what was right."

The straightforward approach paid off, Crosby testified, pointing to satisfactory arrangements made with no less than 108 different property owners.

Starting a log-hauling railroad wasn't the exclusive privilege of the logger. Businessmen in other fields saw the opportunities of providing a common service and successfully catered to lumber mills and logging operators along their lines.

In Oregon, some municipalities sought to capitalize on the potential benefits of running railroads into the woods and bringing the logs to the town's mills. The movement started in 1915 when citizens of Grants Pass became impatient after the 12 years of false starts that their local railroad, the Grants Pass & Eureka, had made toward its California destination. Their lobbyist at the Oregon State House helped

pass a law permitting municipalities to build, buy and operate railroads for profit.

Medford, Prineville and Klamath Falls were among the other towns which bonded themselves to enter the railroad business. But governmental railroads ran a difficult course. The only one to meet with clear financial success was the Municipal Railroad of Klamath Falls. Its 20-mile line out to Dairy was sold at a profit in 1919 to become part of the Oregon, California & Eastern.

The big mainline companies were annoyed by the fact that practically anybody could declare his railroad to be a common carrier. Sometimes the logging lines pre-empted the choicest or only feasible rights of way between two important points. Condemnation of one public service corporation by another was usually out of the question, and the logging line which was on the path to empire chosen by a mainline giant had to be bought out.

One such innocent was Willamette Pacific Railroad Co., which became a pawn in one of the last major battles of the Western railroad moguls. It had been incorporated in 1911 by

Wendling-Johnson Lumber Co. for the prosaic purpose of hauling logs.

Across the Siuslaw River, British capital was behind the construction of Pacific Great Western Railway, designed to link Coos Bay with the Willamette Valley. Southern Pacific saw this as a threat to its own ambitions to tap the unexploited Coos Bay markets.

S.P. acquired Willamette Pacific, and began a war of nerves with the rival line across the river. Press releases and rumors were the major weapons. The power play ended when S.P. bought out Pacific Great Western at a considerably inflated price, and built peacefully on into Coos Bay in 1916.

The climax of nearly a century of railroad wars took place in Oregon in 1914. The cause was a pair of large lumber mills which were under construction in the isolated community of Bend. Two Western railroad giants of the day, J. J. Hill and E. H. Harriman, headed their rival lines south from the Columbia River. Before an agreement was reached, the struggle for a right of way up the narrow canyon of the Deschutes River had reached comic opera proportions. Armed conflict took place between the rival crews, sabotage was done and hundreds of thousands of dollars was poured into wasteful parallel construction. It would take decades of revenues to indemnify the costly war.

Another Hill venture, Pacific Eastern Railroad, was designed to be a link in the magnate's plans to reach San Francisco. When it became obvious in 1920 that the dream was a costly folly, the two million-dollar line was sold to a lumber company for \$270,000. It serves today as a log-hauler for Medford Corporation.

In 1905, four California logging lines found themselves engaged in an unusual competition. The prize was a bonus of \$100,000, offered by the citizens of Klamath Falls to the first railroad to reach their doorstep.

Klamath Lake Railroad, owned by Weyerhaeuser Timber Co., had the advantage on the northern end of the course, but faced a costly construction job to tie up with Southern Pacific 30 miles to the south.

California & Northeastern Railroad, owned by Weed Lumber Co., put 250 men to work grading a 75 mile extension which had a comparatively easy grade into Klamath Falls.

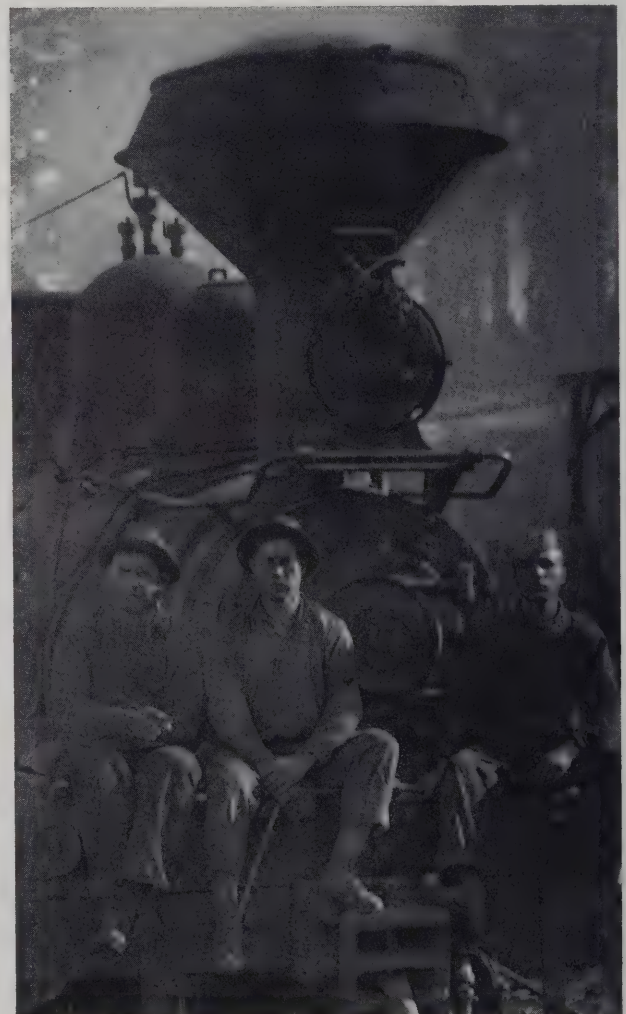
McCloud Lumber Company's McCloud River Railroad pinned its hopes on a right of way that would take it 60 miles due north.

While the logging road of Diamond Match Co., out of Chico, had the greatest distance to go, it was the most likely contender. Diamond Match was owned partly by Financier Jay Gould. It was known that Gould had dreams of breaking into the transcontinental railroad game. Diamond's logging road might be the means.

But Northern California was the domain of the powerful Southern Pacific Railway, and the giant stirred at the threatened intrusion. As a counter, President Harriman formed Chico & Northern Railroad Co. as a subsidiary of S.P. Without delay, it bought Diamond's main line logging road and leased it back to the company.

Having sealed off the Gould threat, Harriman then sat back to watch the struggle between the three remaining lines. It was a safe pastime, for no matter which lumber company pocketed the \$100,000 bonus, its rails would have to connect with S.P.'s mainlines.

Finally, in 1906, Harriman tired of the slow action and announced that S.P. would build into Klamath Falls. The logging lines discarded any



mainline ambitions they may have had and concentrated anew on the business of hauling logs.

About the same time, two large railroads began their bidding for Bellingham Bay & British Columbia Railroad, which controlled a key stretch of track between Puget Sound and Canada. Great Northern Railway Co. was dominant in the area and made insistent offers to buy the road as a supplement to its Bellingham-Vancouver line. The owners, Bloedel-Donovan Lumber Mills, resisted, feeling that another railroad in the area would be good for both the lumber business and the community. They scorned GN's offer and sold BB&BC to a grateful Chicago, Milwaukee, St. Paul & Pacific Railroad.

Disaster came to one logging line that had expected to be taken over by a mainline giant. When Fred Herrick Lumber Co. received a contract to buy Forest Service stumpage in central Oregon, it contained a requirement that a railroad be built into the timber.

Herrick was a successful Idaho lumberman who believed in the principles of rugged individualism. Without subsidies of any kind, but with an unstated hope that Union Pacific would take over the line as soon as it was completed, Herrick boldly embarked on the project that had deterred lesser men.

DECORATIONS were frequently applied to logging locomotives. Engineer of the One-Spot at left obviously bagged his buck during the last deer hunting season. Christmas spirit of the headlight wreath at right doesn't seem to be shared by the Shay's crew. Flags, whiskey bottles and underclothing sometimes marked lighter occasions, while black crepe mourned the passing of the engineer.

Bids for construction of the proposed 90-mile Malheur Railroad were sought in 1924, but proved too high.

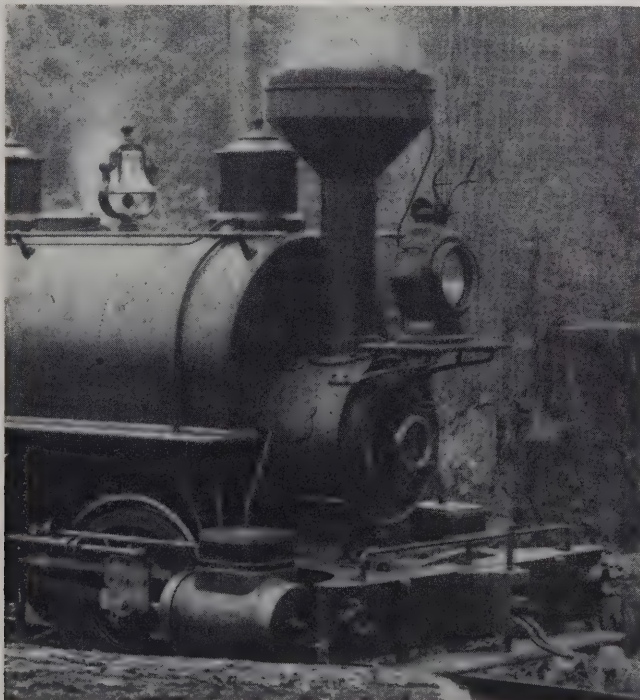
"So we decided to do the grading with local help," Herrick related. "We got out and taught some of the ranchers how to build a railroad. It cost us about \$1,375 a mile, exclusive of track."

In spite of ingenious shortcuts, Herrick had invested a million dollars of his own money in the road by 1927. The Forest Service contract had to be rewritten four times to allow Herrick to continue.

As expected, Union Pacific bought the 30-mile section which had been completed between Crane and Burns, but the remaining two-thirds of the line were still in Herrick's hands.

As the first to enter the town of Burns, Malheur Railroad became the object of the inevitable civic celebration. This time the optimistic speeches had a hollow ring. Herrick was broke. Both he and Chief Forester Greeley were being investigated by Congress on a charge of collusion in the government timber contract. And Union Pacific showed no interest in bailing Herrick out by buying the rest of the troubled railroad.

Along with Greeley, Herrick was cleared of the collusion charges, but the railroad venture had proved his undoing. Fred Herrick Lumber Co. was soon bankrupt. Edward Hines Lumber Co. took over, and operates part of the old Malheur Railroad today as Oregon & Northwestern.





SUNDAY OUTINGS provided an incidental source of revenue for Oregon & Southeastern Railroad. When log trains were not running, speeders were rented out to picnic-bound groups. No deposit was required on the rolling stock, which could go neither fast nor far.

At one time, nearly half the large logging operators declared their main line trackage to be in common carrier status. Among other incidental benefits, it meant that the little logging line could issue courtesy passes, just like any other common carrier, and swap them with officials of the big mainlines. The inequity of allowing a free ride on the entire Pennsylvania Railroad system, for example, in theoretical exchange for a two-mile ride in a leaky crummy on the Knothole Western, did not escape the big railroad company officials. But they were stuck with one of the evils of their own pass system, and besides, some of the jerkwater lines were owned by companies which shipped out lumber over the big roads.

A significant story is told about the general manager of a transcontinental railroad, who many years ago was okeing the annual pass list. Opposite the name of a pretentious-sounding logging road whose president had sent in a courtesy pass, the general manager wrote: "Never heard of this one, but better issue them a black-mail ticket."

To the brass in the lumber and logging companies, the creation of a separate common carrier company sometimes meant the acquisition of such impressive new titles as director, president, vice president or manager of a railroad. *Poor's Manual* in 1887 listed a C. E. Camp of

Caspar & Hare Creek Railroad as vice president, superintendent, chief engineer and purchasing agent. If the railroad had an office, no doubt Mr. Camp would have been assigned as janitor, too, for the Caspar & Hare Creek line was only seven and-a-half miles long.

More of a hazard than a benefit in common carriers was the paying passenger business. Some logging lines had great hopes for making money at it, while others felt it necessary only to comply with regulations or the needs of local residents. Except for a few such lines as California Western, Yosemite Valley Railroad, Lake Tahoe Railway and Sumpter Valley Railway, the logging operators generally considered passengers other than employees to be a nuisance, and avoided any interference with their railroad's major mission of getting logs to the mill.

Any arm-waving pedestrian on the right of way would always be picked up by a log train anyway, though it sometimes meant riding to town at unpredictable settings somewhere between the pilot stand of the locomotive and the caboose.

A major enticement for loggers to join the list of common carriers was the right to share special freight rates with mainline companies. Equipment and supplies brought in for the logging operation received a transportation discount, as did logs or lumber going out.

The rake-off was a sore point with the main-

line railroad companies. Until the tap lines decision settled the matter, they harassed the small operators with scores of legal challenges. The logging railroader was generally upheld in his defense before courts and commissions, with the result that a Western logger didn't feel that he had made his mark in the world until he was running a common carrier.

Such a status could be improved considerably by the proper choice of a name. It was one of the bonuses that came with establishment of a common carrier. Nowhere does the Western logger's personality show up so vividly as on the list of his railroad names.

Some of the titles were outrageously presumptuous, as in the case of Colorado, Utah & Western, which never laid tracks more than six miles out of Fraser, Colorado. Great Southwestern aimed southwesterly sure enough, but only for five miles.

The grandly named Washington, Idaho and Montana Railway runs only three miles in Washington and not an inch in Montana. The California & Oregon Coast Railroad never made it to California nor anywhere near the Oregon Coast. Great Southern Railroad struggled as far south as Friend, Oregon, and expired.

"Pacific" was a favorite in Western railroad titles. But among the dozens of logging lines using the name, not more than a few ever got close enough to their namesake ocean to sight a saltwater seagull.

Minarets & Western ran neither westerly nor within a dozen miles of its namesake town of Minarets. Washington Western ran almost due north and south. The railroad of Mason County Logging Co. wandered around Thurston and Grays Harbor counties, but never managed to get into Mason County.

Most of the loggers' common carriers bore names descriptive of their actual course, rather

than impressive destinations they'd never reach. Even so, it was possible for the title to become a bit unwieldy. Such lines as the Olympia, Sherman Valley & Grays Harbor Railroad & Lumber Co.; Snohomish, Skykomish & Spokane Railway; and Coos Bay, Roseburg & Eastern Railroad & Navigation Co. inspired a loggers' joke that it took two box cars just to carry the railroad's initials.

Railroad shippers seeking a routing in Northwestern Oregon's Columbia, Clatsop and Tillamook counties could never be sure which line was which. At one time or another, logging operators in the area had named their common carriers the Columbia & Nehalem River Railroad; Columbia & Nehalem Valley Railroad; Columbia City & Nehalem Railroad; Columbia, Nehalem & Pacific Railway; Columbia River & Nehalem Railroad; Goble-Nehalem & Pacific Railway; Goble, Nehalem Valley Railway; Goble & Nehalem Railroad; and Clatskanie & Nehalem Railroad.

Indian names had a sometimes melodious influence on the logging lines of the West. There was Shoshone & Clearwater Railway, Navajo Southern, Zuni Mountain, Apache Railway, Kootenai Railroad, Hetch Hetchy & Yosemite Valley and Big Blackfoot Midland.

Writer Charles Nordhoff spoke for other Indian names when he wrote in *Harper's News Monthly Magazine* in 1874:

"When you enter Washington Territory, your ears begin to be assailed by the most barbarous names imaginable. On your way to Olympia by rail you cross a river called the Skookum-Chuck; your train stops at places named Newaukum, Tumwater, and Toutle. Seattle is sufficiently barbarous; Steilacoom is no better; and I suspect that the Northern Pacific terminus has been fixed at Tacoma because it is one of the few places on Puget Sound

PASSENGER TRAIN was a common sight in the woods. These coaches of Washington Pulp and Paper Co. had seen better days on the Great Northern before being used to haul wood crews between camp and the setting.



whose name does not inspire horror and disgust."

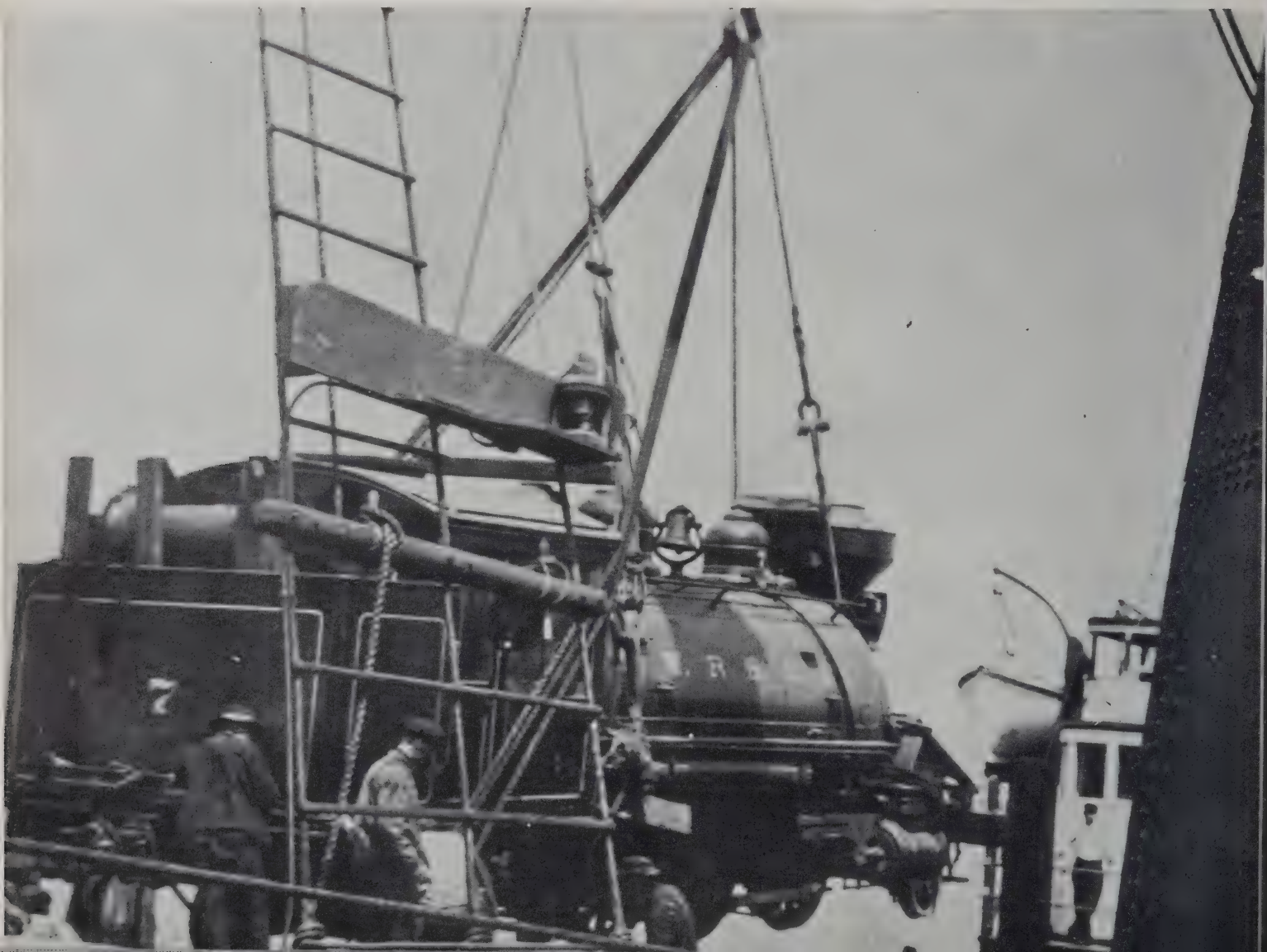
Nevertheless the Indian heritage persisted, adding to America's logging railroad history such winsome names as Little Skookum & Chehalis Railroad, Cowlitz, Chehalis & Cascade and Big Creek & Telocaset. And who can deny that the very sound of Klickitat Northern in itself echoes the rhythmic progress of a steam train?

Poetic euphony is found, too, in such lines as Noyo & Pudding Creek; the Glacier, Indian Valley and Sugar Pine railroads; Kaweah & Giant Forest; and Red River Railroad.

Some of the loggers indulged in the luxury of naming their railroads after themselves. Others displayed delightful whimsy by using such names as Ping Pong Railroad, Keno Railroad, Hoo Hoo Railroad, Skookum Railway and O. K. Railroad.

The history of railroad titles must reserve a special place for Irishman Henry McCleary, who scorned place names, Indians and pretentious destinations. His two battered old locomotives were painted with the proud green legend, "Shamrock & Western."

SEA-GOING LOCOMOTIVE of California Western is deposited on the wharf at Fort Bragg after a trip up the coast from San Francisco. Number 7, a 1909 model Baldwin, was one of many logging locomotives which operated on lines far removed from other railroads.





SHAY NUMBER 2 of Georgia-Pacific Corporation's Feather River Railway still serves on the scenic canyon run to Feather Falls.

MODEL T FORD powered this train on its common carrier run to town. Traller car was added to the consist on weekends when traffic picked up.
(Darius Kinsey photo from the collection of Jesse Ebert)





LOG DUMP OF YEON & PELTON on the Columbia River near Rainier in the last century. Logs were unloaded from cars by means of hand-operated jacks. (Ore. Historical Society)



LOG LOADING in early days made use of either gravity or portable steam engine to roll logs onto cars. In this Redwood region scene, pole at right supports a wire rope line manipulated by the donkey engine at rear.

NARROW-GAUGE CLIMAX shoves a steam loader into position on the ridge-running line of LaMoine Lumber & Trading Co. Both railroad and saw mill were located on mountain tops, with lumber being flumed seven miles down the Sierras to Dunsmuir.



LOADING LOGS onto flatcars was another chore performed by locomotives. This wood-burning saddle-tanker is tugging a wire rope which, through a pulley arrangement called "parbuckling," will roll logs onto the cars. Scene at McDougal's camp in 1901.





McGIFFERT LOG LOADER used by Feather River Lumber Co. was a popular type of steam jammer found in the pine region from about 1915 to 1950. It pulled empty cars from the rear, loaded them and winched the loaded cars down the track.

SHOVEL LOADER of Greenlaw Lumber Co. employed a simple pick-up-and-drop method of getting logs onto cars. Horse-powered high wheels were widely used in the Western pine region into the '20's to bring turns of logs to the landing.

SPAR TREE LOADING RIG became popular after the inauguration of high lead logging about 1910. Rail-mounted electric donkey at right was able to yard and load logs through an elaborate series of cables and pulleys attached to the top of the spar tree. Photo shows mid-'20's operation of Sugar Pine Lumber Co.



BOOM LOADER of La Moine Lumber & Trading Co. employed a log-handling principle still used in the woods today. The rail-mounted loading engine, which could be moved from place to place, has been replaced by permanent reload points on the surviving railroads.

PORTABLE HIGH LEAD RIG of Modoc Lumber Co. in 1919 used an overhead loading method where possible. Rail-mounted donkey engine has skidded this turn of logs up the hill from where they were felled and will drop them on skeleton cars.



STEAM DONKEY ENGINE had come a long way by World War I. This skid-mounted log-handler of Snoqualmie Falls Lumber Co. could winch itself from place to place but was transported to distant settings by rail.



LIDGERWOOD SKIDDER and loader was the ultimate development in steam woods technology. This car-mounted monster was used by Weyerhaeuser Timber Co. to load logs with a heel boom, skid logs on ground leads, haul logs through the air by means of the portable spar and jockey cars into loading position — sometimes all at once.

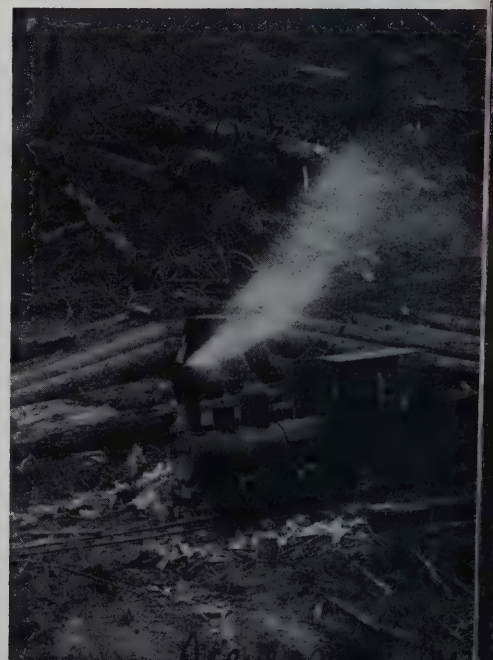
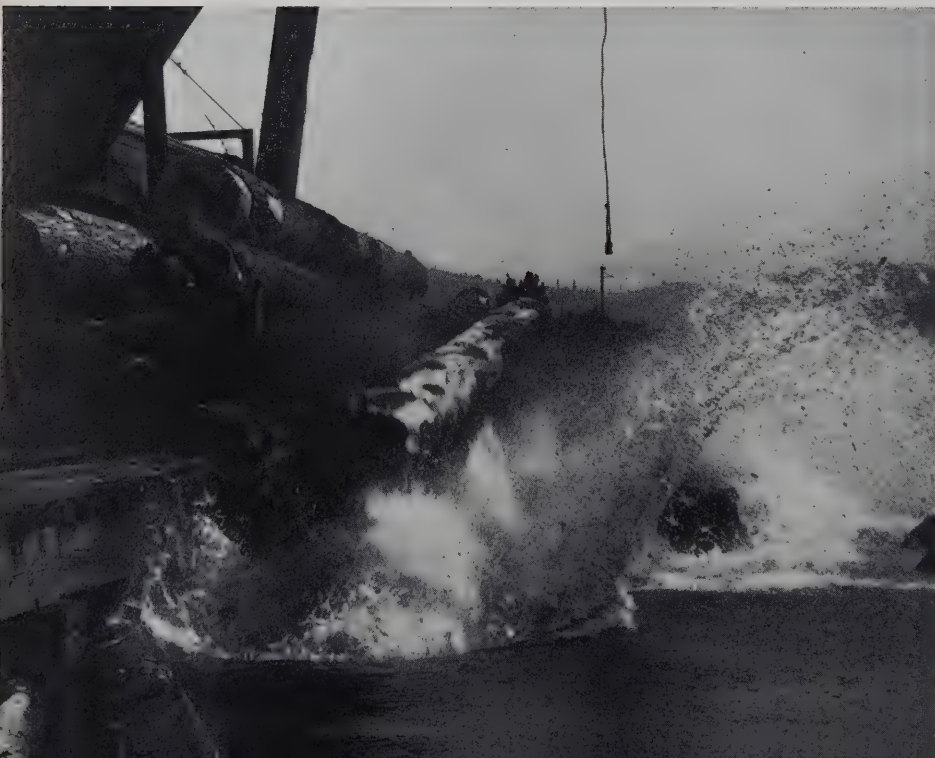


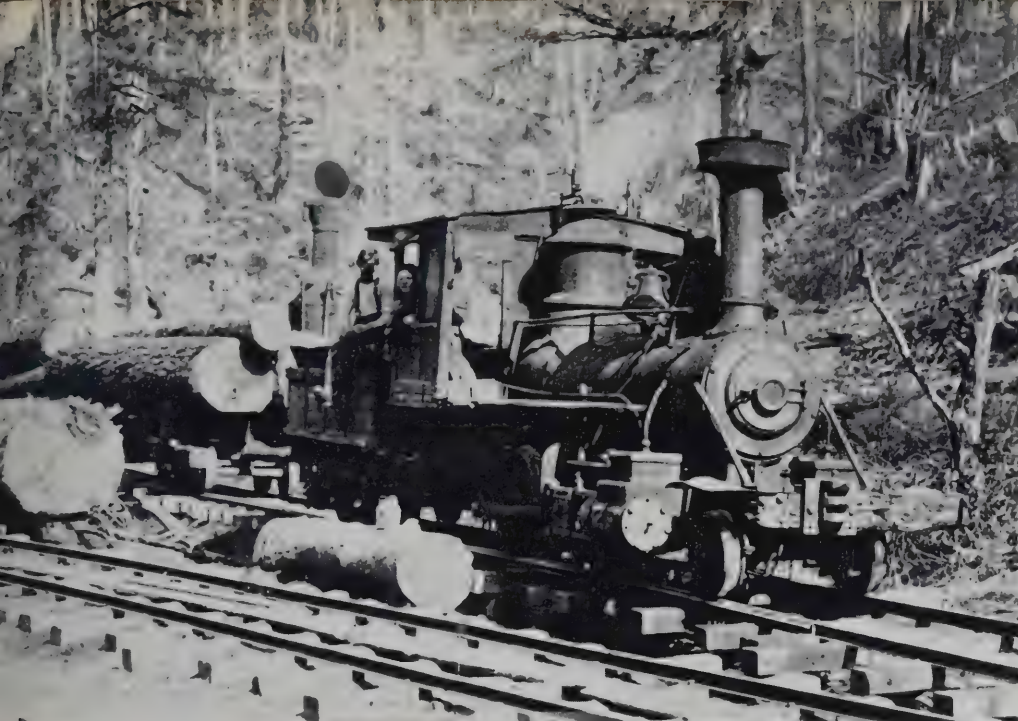
SLIDING JAMMER, A gasoline-powered loading rig, moved along the cars on its own temporary rails. As a car was loaded, the jammer was winched to the next car on wooden or steel rails laid across the car beds. Scene at the Elk River operations of Potlatch Lumber Co. in 1928.





SHAKY TRESTLE ON THIS Northern California pine operation wouldn't handle both the locomotive and loaded cars. To get the flats into unloading position at the dump, they were uncoupled from the Shay and given a quick push onto the trestle. Remaining safely on firmer roadbed, the locomotive then hauled the cars back to the unloading boom by means of a cable.

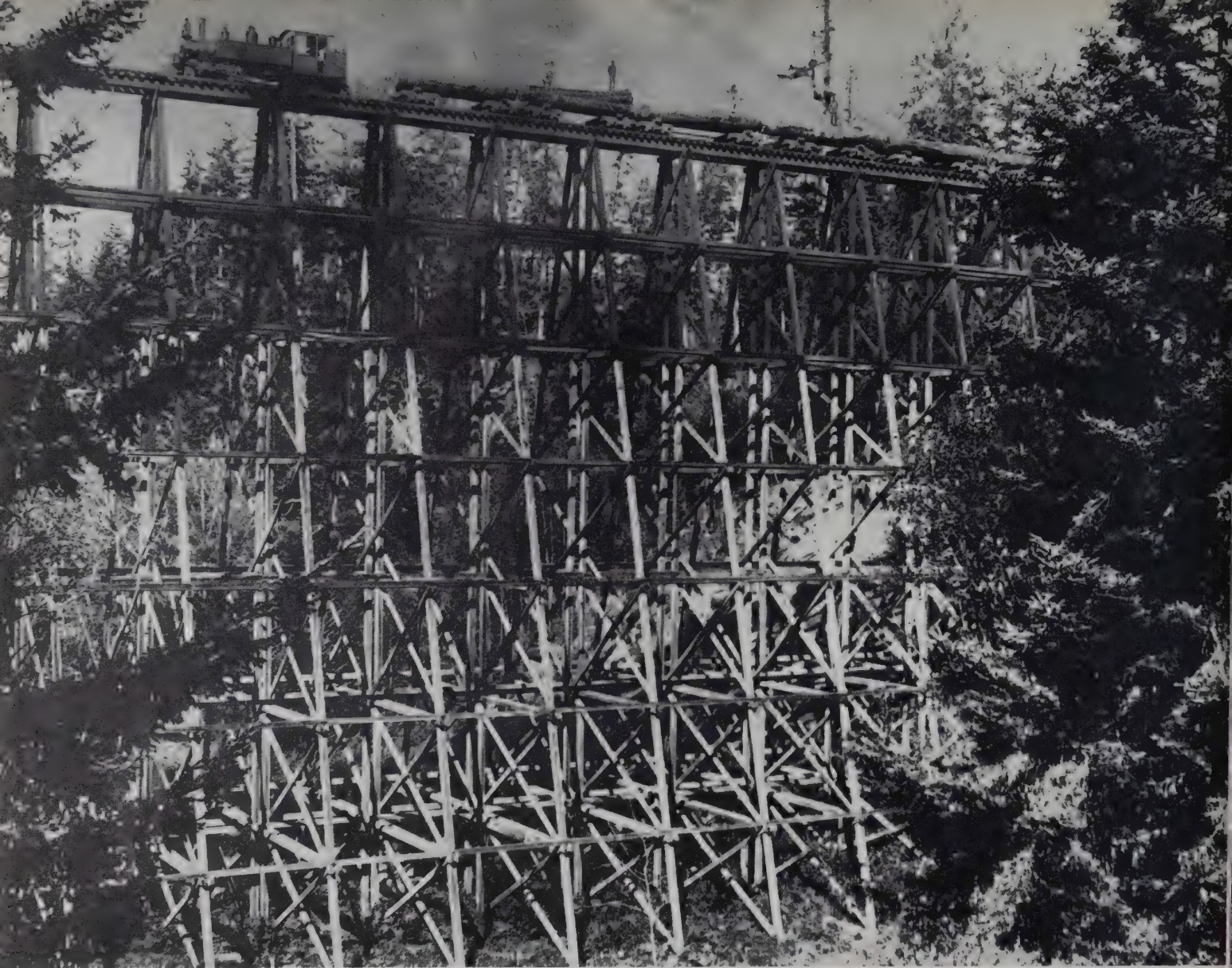




(Bottom) Hinckley & Co. 0-4-0 was built in 1872 for a coal company at Coos Bay and later used for logging at Blossom Gulch.

VARIETY of woods motive power is evidenced by these narrow-gauge engines which operated within a few miles of each other in Coos County at the turn of the century. (Top National locomotive was once the pride of Prosper Mill Co. (Right) Wood-burning dinkey used on John Aasen's operations at Norway. (Left) Spunky little locomotive of Campbell & Swigert near West Fork. (Jack's Photo Shop, Coos Bay)





LOCOMOTIVE NUMBER 3 and Jughandle Creek trestle of Caspar, South Fork & Eastern Railway were both slated for disaster shortly after this photo was taken. The trestle, once the largest ever built of wood, was a pile of kindling after the California earthquake of 1906. "Smilax," the 35-ton Baldwin, was purchased new after its display at San Francisco's Mid-Winter Fair of 1894, and later dove off another trestle while hauling logs.



THE SCENERY INSPECTORS

"If we could flatten out these hills," loggers were fond of saying, "the forest would cover all of the U. S. and part of Texas, too."

Pushing steel into the hills became the most expensive, the most dangerous and the most frustrating part of the logging business.

The problems of laying out and constructing a railroad into the timber seldom gave the operator more than temporary concern. Had he been better educated in the physical sciences he might have had occasion to pause, consider and throw up his hands.

But the mills needed logs, and the logger aimed his right of way ingeniously around the mountains, up them, across them or through them. The word "aimed," rather than something like "platted," would have been preferred by the early logger, for the course of the railroad was usually ad lib. It was he who referred to the process of locating a railroad line as taking "a shot in the brush."

Of necessity, the laying out of a logging road was a supremely casual matter compared with the elaborate preparations of the big mainlines.

Where the subsidized or well-financed mainline road was built to last for decades, the logging spur might be used for only a matter of months before it was pulled up and moved elsewhere. Nor was passenger comfort and safety the concern of a logging line.

There was another major difference between log-haulers and the big common carriers. The logger's course might best be compared with an irrigation project. The object was not to find the best route through the countryside, but to cover the entire area with a system of lines.

Historically, the job of plotting the course of the rails fell to the woods boss. In the past he had sized up the terrain to decide where oxen and horses should skid the logs, and he now guessed that the rails should follow the creek bottoms.

Confronted by a mountain or a drop-off, it was a simple matter to pull up the steel and hunt for another creek.

The supply of new creeks was getting scarce, and much of the mountainside timber remained untouched, when the subject came up for dis-

cussion at an early session of the Pacific Logging Congress.

Survey the ground two years or more ahead of the operation, said a brash young man named J. J. Donovan. Your logging foreman cannot lay out these roads and construct them without expensive mistakes, the line of heresy continued. Keep your main line grades below three per cent, Donovan advised, and don't exceed ten per cent anywhere.

How to get the railroads out of the creek bottoms and into the timber on the hills was the problem of the day. The few Logging Congress members who recommended topographical surveys and maps were thought to have been kicked in the head by a Hodag.

"Possibly there's some value in this idea of topographical surveys," admitted one delegate, "provided you don't go too far and spend too much money. As far as I'm concerned, I'll stick with the trusty compass and a good eye. They're pretty handy instruments to have around and they don't cost much."

The only way to reach the timber in hard country, cracked one woodsman, is to log by balloon. Or cut off the tops of the trees so they're level, suggested another, and run the railroad over the stumps.

As the years passed and timber stands retreated from the mills, operators reluctantly recognized the need for employing the tools and talents of the construction engineer.

In the woods, he was called a logging engineer, or, more often, the "scenery inspector." He was barely tolerated when he first appeared just before World War I. His salary of \$100 a month or so was a luxury to the operator and a goad to the lesser-paid. And the woods boss still felt that he could lay out a railroad without the services of a college punk.

It wasn't an easy profession. The engineers indicated as much in a long poem they recited to each other (printable portions of which follow):

We lay out their railroads and work in the rain

*We walk to our jobs, we don't ride a train,
That job of the company's engineers—*

*The company's poor damned engineers,
Living the lives of trappers.*

While the logging engineer had other chores that made use of his training, his main responsibility on a railroad show was to locate routes to and from the timber. Such rights of way were to be the cheapest, fastest and safest—usually in that order of priority.

The scenery inspector brought order to the building of woods roads, leaving his mark in some remarkable engineering feats that complemented the native ingenuity of the logger.

Contrary to the practice in Eastern lumbering operations, the Western railroad was sometimes built from the timber outwards, following the path of least resistance down to the main line or log dump. This meant that construction supplies and equipment had to be taken out to the remote construction site by some means other than train.

This necessity brought some uneasy moments for Warren Spruce Co. during World War I, charged with hauling airplane spruce out of Oregon's precipitous coastal forest. The railroad would have to bridge a large number of canyons and draws, calling for immense quantities of piling, timbers and ties.

The pace of the Kaiser's air war didn't allow time to build a temporary pioneer road.

How to get the railroad construction materials to distant building sites was the problem

SKYLINE CARRIED PRE-FABRICATED units into place on this trestle built at Weyerhaeuser Timber Company's Vail logging operation.



of H. N. Ormsbee, Warren's logging engineer. His inspired solution helped the company earn a War Department citation for meritorious service.

Recalling the engineering tenet that if you can't beat Nature, join her, Ormsbee first put his construction crews to work building barges. These were loaded with the uncounted tons of timbers and planks needed to build the railroad. The barges were then towed across the bar at Newport and out into the Pacific Ocean. At points opposite the shore locations where materials were needed, the vital cargo was jettisoned on the high tide. Waves floated the wood ashore. On the beach, lines were attached to the salvaged jetsam and horses snaked the materials through the sand to waiting construction crews. "High-tide Ormsbee" completed his railroad on schedule.

Until the railroads came, water had been the best friend of those who sought to move logs from one place to another, and Lamb-Davis Lumber Co. beneficially combined the two. After years of floating logs down the Wenatchee River, a large number of strays had slipped away from rafts and beached themselves along the banks. The high-and-dry logs weren't worth salvaging individually, but collectively, they represented a sizeable investment.

A monumental retrieving system was rigged up. At the point where the Wenatchee enters the Columbia, a string of logs was anchored from shore to shore to make a boom. Many miles upstream, Leavenworth Dam was filled to capacity. When the dam's gates were suddenly opened the high flood waters neatly floated the scattered logs into the boom. Lamb-Davis engineers next built a railroad line to the boom, over which cars carried the salvaged logs 20 miles back upstream to the mill.

Not all encounters between logging engineers and water were pleasant ones. For F. Hill Hunter of Lamm Lumber Co., the assignment to build a four and-a-half mile tangent across Oregon's Klamath Marsh brought a series of misfortunes that gained the sympathy of the entire industry.

The plans were sound. Hunter first trucked to the site a Diesel clamshell shovel and the materials to build a huge scow. The crew went to work and soon had the shovel mounted on a 64-foot barge.

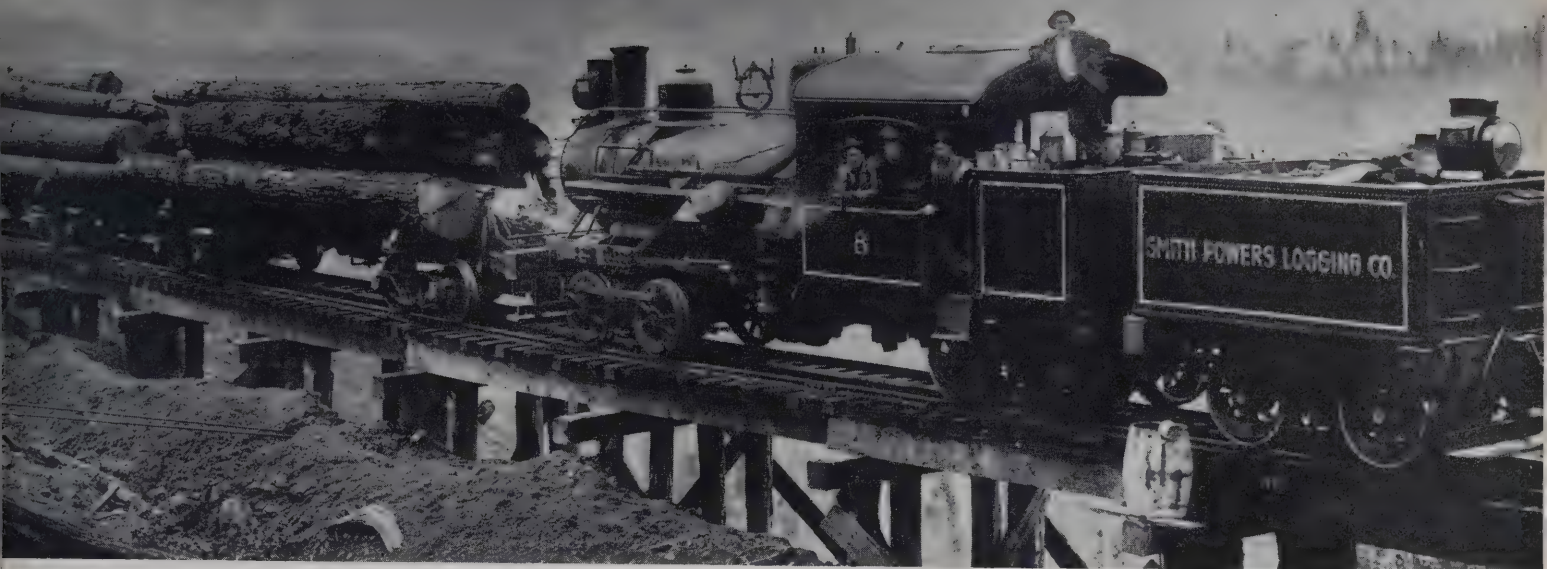
Adversity first appeared while the men were digging a 30- by 100-foot hole in which to float



ROADBED OF HUGE LOGS is perfectly adequate for this train of shingle bolts on a Washington operation about 1905.

"SWEDE POWER" was the mainstay of early logging railroad construction and maintenance. This photo at Yeon & Pelton's Columbia River operations in the 1890's shows a preponderance of crowbars and shovels. Hand jack held by man in center was used to move logs and to replace derailed rolling stock. Superintendent at right, rear, used bicycle type speeder. (Oregon Historical Society)





ROUGH-HEWN TIES were a feature of many logging spurs. Around 1910, this track gang was laying redwood ties and 30-pound relay rail through an area that had been logged 45 years earlier.

TRESTLING OF SMITH-POWERS operation clung to the precipitous hillsides of southwestern Oregon for a total of 20 miles. Wire cables at left "hog-tied" the piling to prevent it from shifting.





LOGS WERE A CONVENIENT and cheap method of filling when this structure was built around 1910. Bradley Logging Company's #5 Climax hauls a rail-mounted donkey engine near Cathlamet, Wash.

PUSHING STEEL

The logging operator knew generally where he wanted his railroad to go, but he sometimes had trouble getting it there. Canyons, rivers, mesas and steep mountainsides were sprinkled generously around the 11 Western states, making a timbered obstacle course that could put even the best logging engineer in the bight of the line. As logging settings crept into the back country, railroad building became the most difficult phase of the business.

In his war against hard-looking country, the railroad logger found that his best weapon was blasting powder. He used it lavishly, surpassing for a time even the mining and construction industries as the heaviest user in the West. It was taking an average of two and-a-half tons of powder per mile just to remove stumps from the right of way. The grading which followed took about as much.

Hammond-Tillamook Lumber Co. brought the average way up for the year 1927 when it tried to keep a new main line grade below five and-a-half per cent. Working around the clock with the aid of portable lighting plants, the construction crews removed as much as 16,000 yards of earth from cuts reaching 72 feet in height. At one point, a 280-foot long section was filled, requiring the handling of 17,000 yards of earth. It was more than enough material to fill the combined space covered by the Russ Building in San Francisco, the Smith Tower in Seattle and the Lumbermen's Exchange Building in Portland.

When Hammond-Tillamook's new 12-mile line was finished, the bill averaged out at \$25,000 a mile.

Smith-Powers Logging Co. upped its bill to \$75,000 a mile when blasting out a 1700-foot section of roadbed containing 32,000 yards of rock.

Loggers found that when a gap was larger than 10 feet wide, it was usually cheaper to build a trestle than to fill with earth.

For understandable reasons, logging railroad builders favored trestles and bridges made of wood, rather than steel or concrete. The choice was to account for some monumental results.

The honor of owning the highest wooden railroad bridge was claimed successively by San Francisco & North Pacific, with 137 feet in 1880; Caspar, South Fork & Eastern, with 146 feet in 1884; and D. A. Robertson, who trailed logs 202 feet above the waters of Charlie Creek in 1902.

Pacific States Lumber Co. in 1927 built a trestle just two and-a-half feet higher than Robertson's and assumed the temporary world's championship.

The fifth highest of all railroad bridges in the country was claimed by Simpson Logging Co. in the late '30's, but the achievement was scorned by other loggers. Simpson had committed the unforgivable blunder of building the 400-foot-high structure out of a wood substitute called steel.

No company had as much trestling as Smith-Powers Logging Co. Out of a 50-mile line, a total of 20 miles ran on piling built from two to twenty feet off the ground.

S. S. Somerville's entire roadbed at Napavine in 1910 was built on piling from one to six feet above the ground. His construction costs were kept to a modest \$1,306 per mile.

Boca & Loyaltan boasted 77 trestles in its 56 miles and the Sonoma Lumber Co. line crossed Hulbert Creek 42 times in less than four miles. On the original line of California Western, trains ran over a bridge or trestle an average of once every third of a mile—for 40 miles.

Rising waters and sudden floods proved a constant hazard to the wooden crossings. The Pacific Lumber Co. had to contend with the Eel River, a seasonally violent stream which even today seals off U. S. Highway 101 on occasion. Tired of building replacements, the company anchored its Eel River bridge in concrete and rock and let the seasonal high waters flow



COOLIE LABOR, IMPORTED by the mainline railroads in the '60's and '70's, was later used by Loma Prieta Lumber Co. and a number of other logging operations. (SP photo from Amaragosa Memorial Library)

harmlessly over the top of the tracks.

Downstream, E. J. Dodge Lumber Co. won its winter battle with the Eel by discretion instead of valor. Each fall, its logging railroad tracks were taken up, and each spring relaid in the same riverside location.

Everett & Monte Cristo Railroad simply embedded its ties in concrete as a foil to the rising waters of the Stillaguamish River.

Most of the trestles were considered temporary. "The trestle was expected to fall down," said one engineer, "as the last train passed over it."

Some of these structures, "engineered" by loggers, and built by labor recruited from city skid roads, were viewed with something less than respect by the trainmen who had to cross them daily with loaded cars. In more than one instance, it was discovered that for good reasons of safety, the entire train crew would jump off the train before reaching a rickety trestle. The engineer cracked the throttle, and with the rest of the trainmen, made the dash down one side of the canyon and up the other to meet the train safely on the other side.

As logging progressed, the terrain became more difficult. The longest single trestle grew from Arcata & Mad River's 700 feet in 1884 to the 8,000 feet of Warren Spruce Co. in 1918.

Some of these structures contained the equivalent of a quarter-million board feet of lumber—enough to build a town of 22 six-room homes.

The climax was reached in 1942, when Weyerhaeuser Engineer Walter Ryan stepped

back to admire the biggest of them all. He had created a railroad trestle 1,130 feet long, rising 235 feet over Baird Creek. More than 600,000 board feet of treated lumber went into his masterpiece, which is in use today as a fire truck patrol road.

A few miles away, Charles R. McCormick Lumber Co. built the same trestle three times in the same place. It was one of the incredible blunders that can befall men in a hurry. The comedy of errors began with the spring floods of 1926, which washed out the company's trestle over the Cowlitz River. It was late in the era of railroad logging, and the company decided then and there to abandon the tracks for trucks. But first, the woods equipment left behind had to be retrieved. The trestle was hastily rebuilt and the camp, logging and railroad equipment was hauled across the Cowlitz. Trestle Number Two was then dismantled. With a sudden feeling of sickness at the pit of his stomach, the woods super realized that a pair of locomotives had been left behind on a siding in the woods. Grumbling crews were put to work building a third trestle, over which the orphaned engines made their final run to the other shore.

The story of McCormick's misfortune made the rounds of the timber country and probably caused many another bull of the woods to look twice before pulling up the tracks. The woods boss of North Bend Timber Co. had chuckled over the story, too, but little realized that he would provide its sequel. His subsequent action could only be accounted for by the fact that giant Lidgerwood skidders had become a fixture

of the woods. When moving to another setting, the North Bend tracks had been picked up and relaid at the new location. But when it came time to begin logging, the lack of a Lidgerwood became embarrassingly apparent. There was no alternative for the red-faced super but to tear up the new spur, relay it at the old location and repeat the process after the Lidgerwood had been moved.

In the best tradition of the woods, all such human errors were expected to be accompanied by a torrent of profane remarks, and undoubtedly were. The salty vocabulary of the woodsman also received some serious exercise over the matter of railroad tunnels.

Tunnels were usually avoided by the logger as too expensive or unnecessary. It was cheaper to go over the hill via switchback or incline, or more simply, to build the line around the hill.

A. J. Powers claimed that tunnels were make-work projects dreamed up by logging engineers. To avoid both, he boasted in 1916 that he had built five separate switchbacks in one 15-mile section.

The Coggins brothers in 1900 built a six-mile logging road composed entirely of a series of switchbacks.

In some situations it was tunnels or nothing, however, and the first one built for a Western logging road was that of Caspar Lumber Co. in the 1870's.

A few years later, a bull tunnel was carved through a hillside near Westport, Oregon, to permit passage of log-hauling oxen. It was later used by a logging railroad and is still on hand today, causing tourists on U. S. Highway 30 to puzzle over its purpose.

The 2,000-foot tunnel built under Table Ridge Bluff by Eel River & Eureka Railroad in 1884 was probably the longest of its day. But its fame was based on another fact of construction: it ran directly beneath a cemetery.

The 1916 Pacific Logging Congress was highlighted by a report from a proud construction engineer, who told of the geological difficulties connected with the successful completion of a tunnel for Columbia & Nehalem River. It was a challenging job, he related, taking 18 months

HIGH BRIDGE TRESTLE of California Western Railroad & Navigation Co. twisted "like a snake with a bellyache." The 600-foot long structure had reversed 24 degree curves on a 2.4 per cent grade. (Library of Congress)





SWITCHBACK on the main line of Oregon & Eureka Railroad in 1905 was a dangerous, but typical, combination of logging road grades and curves. (Forest History Society)

to complete. Among other feats, he had installed an elaborate system of pipes to constantly drain off the water which came from a quicksand formation above the tunnel.

"This was done," he told the attentive loggers, "in order to remove the cause of a permanently embarrassing result."

Two years later, a temporarily embarrassing result occurred when the tunnel collapsed. The engineer's failure served to strengthen the widely held opinion by loggers that all such experts belonged on the campus and not in the woods.

But the tunnel was necessary to keep logs moving to the mills, so Owner A. S. Kerry scouted up a more modest and competent engineer and built a tunnel that became a legend in the timber industry.

It was a model of safety. In addition to the revolutionary installation of signals at either end, the new tunnel sported tell-tales, the hanging ropes which warned trainmen of the approach of a tunnel.

After the 1918 collapse, a 400-foot long section of the bore was rebuilt to stay. Then Kerry installed a unique device to keep forest fires from entering the tunnel. These were overhead steel gates at either end, held in place by a chain with soft steel links. If a fire raised

the temperature, the soft links would melt, automatically releasing the gate.

In the 1920's, as many as a dozen separate logging companies were shipping their logs on the Columbia & Nehalem River line, and for years an average of a million board feet a day passed safely through the tunnel. At this time, Kerry's common carrier boasted an output of logs greater than any other railroad.

Hartford Eastern Railway negotiated a difficult nine-mile stretch between Granite Falls and Robe which required the building of eight tunnels. But only seven were completed. Tunnel Number Eight collapsed, and a permanent detour was built around the slide. Sealed inside forever are the bodies of seven Chinese workmen who were buried alive.

Aside from human life, the most costly tunnel of them all was comparatively short. It was hurriedly built by the Government's Spruce Production Division on the Olympic Peninsula. Cost was no object in 1918, when hundreds of men were assigned to run a bore for 460 feet through solid rock.

With timber growing close to the tops of the Rockies, Sierras and Cascades, it was to be expected that logging railroads would be lured to unusual elevations.

At one time, all railroad shows in Arizona and New Mexico were conducted above 6,500 feet. Both Hallack & Howard and Southwest Lumber Mills ran lines more than 9,000 feet high to log their pine holdings. The loggers around Lake Tahoe operated at elevations averaging 6,000 feet, with the Carson-Tahoe Lumber & Fluming Co. topping the Sierra summit with its lumber line at 7,000 feet.

Sumpter Valley Railroad rose to 5,238 feet above sea level, but climbed 2,000 feet in 12 miles to do it. Sugar Pine Lumber Co. managed a similar climb in only 11 miles by building a steady $4\frac{1}{2}$ per cent grade. Curtiss Lumber Co. had to make 1,200 feet in elevation in only 6 miles.

The grades of Class I railroads across the country average less than one per cent, with maximum rises of about two per cent necessary in mountainous terrain. The steepest climb is 4.7 per cent, used by Southern Railway to negotiate Saluda Hill in the Blue Ridge Mountains.

But the standards of the Eastern road builders were only a starting point for loggers west of the Rockies. After all, they faced terrain so steep that even chipmunks had to double-head to get up the hill.

To avoid building tunnels, trestles, switchbacks or inclines, the loggers preferred to grapple with the terrain in a straight-forward manner. Saldern Logging Co. and Mendocino Lumber Co. were using 12 per cent grades at the turn of the century. Sultan Railway & Timber Co. went to 13 per cent; Forks Logging Co. to 14 per cent. Cameron Logging Co. tried 18 per cent and made it.

Even though a few roads were obliged to employ short grades of up to 14 per cent into the 1920's, the use of steep climbs was falling into disrepute. The sharper grades often required "doubling," in which the train was separated into two or more units to make ascent possible. And too many logs and locomotives—to say nothing of lives—had been lost on the dangerous grades. In their last 40 years, the logging roads tried to keep their maximum pitch below seven per cent.

Curves offered another headache to the railroad builder in mountainous country. Even with the best engineering advice available, California Western, for example, found it necessary to build a 40-mile road without a straight stretch of track longer than a mile.

"What is the curvature limit on your line?"

a small operator was once asked. "I don't know," he replied, "as I've never reached it."

The Sumpter Valley line in its 80 miles made an average of three-quarters of a complete circle every mile. Curves of up to 40 degrees were not uncommon on logging lines and a few of them twisted into a hair-pinned 70 or 80 degrees.

The sight of a train negotiating such rights of way on North Pacific Coast Railroad in the 1870's inspired Pioneer James Fowler to observe:

*It twisted in and twisted out
And left the travelers still in doubt
Whether the snake that made the track
Was going up or coming back.*

A similar reaction was reported by the California correspondent for *Columbia River & Oregon Timberman* in 1900, when he first saw the 13-mile narrow gauge line of West Side Flume & Lumber Co. "The new road is sinuous," he announced, "and can best be compared to a succession of the letter S in reverse and inverse form."

While the loggers found that a curved line was the easiest and cheapest route between two points, the practice contained some built-in problems. There was the added resistance, which was equivalent to a 0.4 per cent grade, for example, on a 10 degree curve.

Another drawback was the need to bend the rails. Most logging operators were not equipped to lay curved rails, and straight rails laid on curves brought slippage and equipment derailment.

The most compelling objection to excessive curvature was the added cost. As always, the dollar sign made the final determination of a logging road's character.

Financial considerations caused the timbermen to hire low-cost manual labor for road work well into the age of mechanization. Most of the time, right of way clearing and grading was done with "Swede power." Often the logger employed the "station" system, in which a man was given a contract to grade a station, or 100 feet of roadbed, at a time. Cost of grading each station ranged from around \$50 in the early days to several hundred dollars later.

The term "Swede power" was not quite accurate. While Scandinavians predominated in Western logging, as they had in the Lake states, they could claim no monopoly. At one time or another, the racial roll call included railroad gangs composed of Bulgarians at George Palmer Lumber Co.; Piute Indians on the Bodie & Ben-

ton; and Japanese and Bulgarians at Hammond Lumber Co. Hindus were sprinkled among the road crews of several companies. Chinese, who had proved their value in building the transcontinental mainlines, were commonly used on the lesser roads.

The employment of "coolie labor" meant the lowest possible costs to the operator, but it wasn't always well-received by others in logging and railroad crews.

This fact of early Western life was discovered by Union Lumber Co. in 1891, when their tunnel-building plans came to a violent halt. White citizens had rioted, objecting to the Chinese labor brought in from the outside. The Orientals were driven out of town.

The crowd was pacified only when Sheriff Standley of Mendocino County pointed out that not a single white man had responded to Union's appeal for local labor. The Chinese drifted back and completed the tunnel, 1,129 feet long through hard rock, without further incident.

The management of Union Lumber Co. could have profited by the similar situation which Bodie Railway & Lumber Co. had experienced 10 years earlier.

A menacing mob had gathered for the popular pastime of driving Celestials away from their work. An alert superintendent rounded up his Chinese crew and hustled them off to their camp near Mono Lake. There they were loaded on rafts and hauled out to an island in the lake by the lumber company's steamboat. They had with them all the camp supplies, including water, and were prepared for a month's siege if necessary.

The self-styled vigilantes were in hot pursuit. They walked the dusty 21 miles from town to camp with a speed born in the heat of fury. But enthusiasm cooled as temperatures rose. Upon arrival, the disappointment of finding the Chinese gone was soon forgotten in the greater misfortune of discovering that the camp water supplies had also vanished.

The alkaline water of Mono Lake has always been unpalatable and the nearest drinking water was located at the foot posse's starting point—21 miles away. As the bedraggled citizens wandered back during the next 24 hours, it is reported that the saloons of Bodie did their all-time greatest business.

Local citizens never again bothered Bodie's Chinese laborers, which might be credited to another preventive move by their superintendent. Without warning, the coolies were fired

from the job when construction came within a few miles of town. White laborers were hired to replace them, the thoughtful superintendent explained to his superiors, "Because there was a very strong miner's union in Bodie."

J. Houghton Logging Co. had its unpleasantness in 1906, caused this time by Japanese section hands. The entire crew of loggers left the woods in protest against the hiring of foreigners. In a day before labor unions, Houghton settled the matter simply by hiring outside strike-breakers, and the old crew gradually returned.

The 75 Italians who left Saginaw Timber Company's payroll in 1915 never did return. They were called back to their homeland for service in the War.

When Cady Lumber Corp. was laying an average of 50 miles of steel each year, it had railroad crews consisting of Americans, Mexicans, Negroes, Apache and Navajo Indians. All races worked in harmony—except the Indians. The woods super soon learned that the two tribes were traditional enemies, and Apaches and Navajoes would never speak to each other, much less work in the same gang.

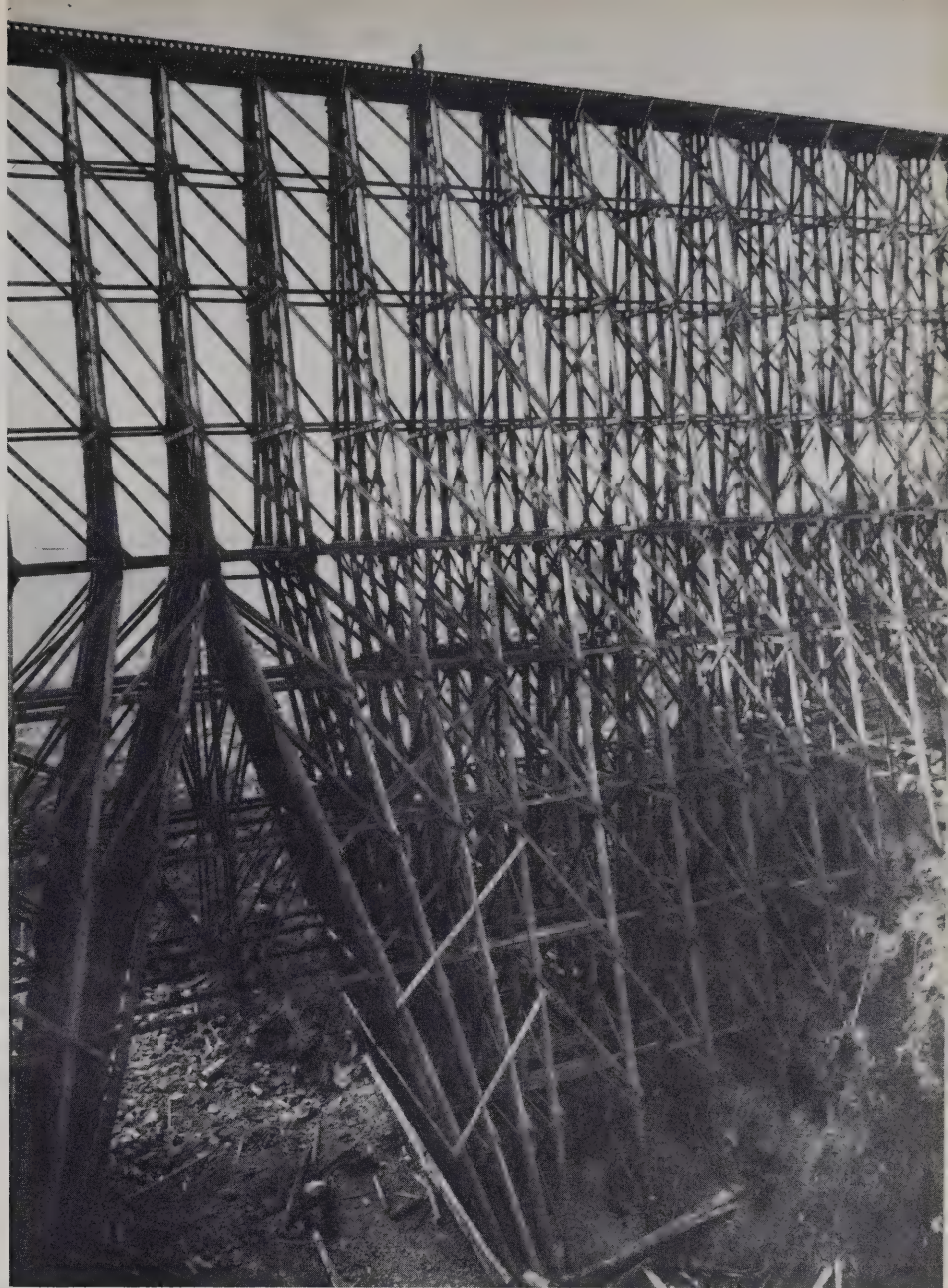
Low cost labor, of whatever nationality, was one reason that modern construction machinery was slow in coming to the woods. Into the '30's, a familiar piece of grading equipment was the Bagley Scraper. This was a simple scoop shovel unit manipulated by cables attached to a donkey engine or locomotive. Developed by John Bagley of Tacoma Eastern Railroad, it was a substitute for the steam shovel which could be afforded only on larger road-grading operations.

By the time that the crawler tractor bulldozer became practical, the pace of logging railroad building was on the decline.

Pioneering the use of tractors for grading a Western logging road was Schafer Bros. Logging Co. The honor was claimed in 1919 when they put four Clevelands on the job.

Large numbers of men were sometimes employed in railroad building. The reason might have been to get more logs to meet a sudden upturn in the demand for lumber, or more often, to convert the timber to cash in meeting a financial crisis.

Construction crews of a hundred men were not uncommon. Albion Lumber Co. in 1902 had 750 men working on its 20-mile line from Albion to Boonville. C. A. Smith Lumber & Manufacturing Co. in 1913 was using 2,000 men exclusively for road construction. During World War I, the Spruce Production Division put 4,200



HIGHEST LOGGING TRESTLE in the world was claimed by Pacific States Lumber Co. between 1927 and 1942. It towered 204 feet over the waters of Cedar Creek, near Selleck, Wash. If laid end to end, its 508 piles would have stretched more than seven miles. (Oregon Historical Society)

civilians and troops as well as 600 horses to work building railroads and camps in southern Oregon. On all its 13 railroad projects the war-time agency at one time used 10,000 men.

Up on the Olympic Peninsula, the government spruce road was taking shape at a rate 75 per cent faster than any other American railroad was ever built. By working night and day, seven days a week, soldiers and civilians in a few months were able to build 45 miles of main line and 124 miles of logging spurs. Not a single log was hauled over the road before the Armistice ended the project.

Never again was the need for logging railroads so urgent, and the record of an average of two miles of line completed each day was never equalled.

Another record was set by the Spruce Division's railroads—they were probably the most expensive in history. While a Congressional investigating committee discovered that it was difficult to ferret out the actual costs, experienced loggers estimated the expense to average about \$30,000 a mile.

The per-mile cost was the same price Noyo & Pudding Creek Railroad paid in 1881 to build

its entire two-mile line and equip it with locomotives and rolling stock.

While other railroads occasionally found their construction costs approaching \$50,000 a mile for short stretches, the cost was far above average. In the 20th century, railroad construction costs varied all the way from \$750 a mile to \$80,000, depending on the topography. A government survey in 1937 found that main line logging railroad building in the redwood region was averaging \$15,000 to \$20,000 a mile; spurs, \$10,000. In the Douglas fir region, average costs then were 10 to 20 per cent lower.

The logging roads consumed large sums of

money, but under proper management, there was never a question of their short-term profitability.

By the 1930's, the West's most accessible timber had been logged off, and construction and equipment costs required an initial investment of \$50,000 for even the shortest woods road. Some lines built by large companies turned into million-dollar projects.

High costs, more than any other factor, brought the end nearer for logging railroads. Only the largest corporations today find that the unit cost of hauling logs by rail is still cheaper than by truck.

VANCE CREEK BRIDGE of Simpson Logging Co. was the fifth highest of all railroad bridges in the world when it was built in 1928. The 450-foot high structure is still used by Simpson's Peninsular Railway.



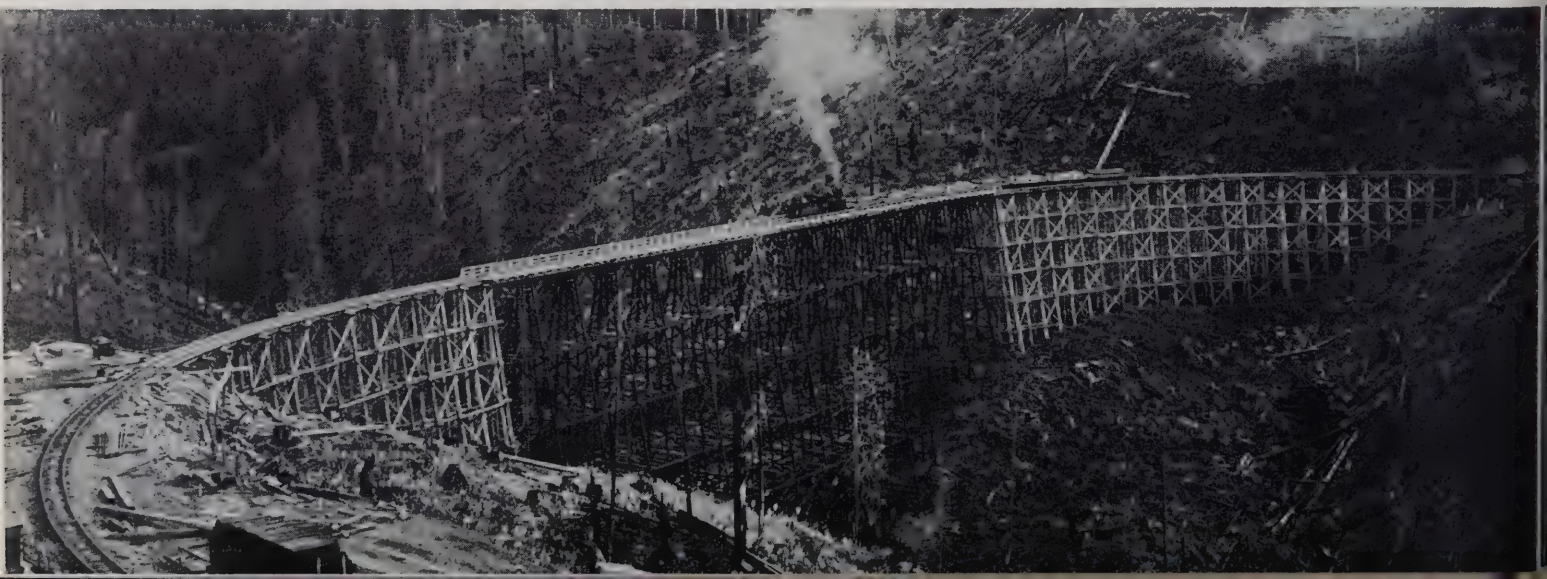


MAYFIELD BRIDGE of Cowlitz, Chehalis & Cascade Railroad became unsafe in its old age. Farrow photo of the last train in 1955 shows that the crew has abandoned the head end locomotive and caboose. They are in a locomotive at the rear, pushing the heavy Number 20 across the bridge. When the leading engine was safely on the opposite bank, crew would walk across the bridge, get up steam and pull the rest of the train across.



TRAIN of Clemons Logging Co. winds toward the mill through land logged 20 years earlier. In 1941, the old Clemons property was converted by Weyerhaeuser Timber Co. into the world's first tree farm.

BAIRD CREEK TRESTLE at Weyerhaeuser Timber Company's Longview operation was the largest ever built for a logging line. It contains enough treated timber to build a town of more than 60 houses.



THE UP AND DOWN RAILROADS

A lot of the West was made standing on end, the logger discovered. To best it, he developed the incline system—the most audacious collection of vertical railroads ever known.

Rising costs of construction as well as rising terrain made the incline necessary to the logging business. It was primarily an alternative to the building of expensive tunnels, switchbacks and contour routes. But the incline would prove to be the peculiar mark of the Western railroad logger; his pride and his glory.

The first logging incline of record was built on the north fork of the Cosumnes River at the foot of the Sierras in 1852. At a pitch of 45 degrees, it lowered log cars 1,000 feet down the hill by a rope and pulley arrangement.

The expedient was probably inspired by the small mining tramways in operation nearby. All used a system which would prove of value for log-handling into the 1940's. Loaded log cars were let down the hillsides by gravity and empty cars taken up by power or reciprocity. A variation made use of a traveling cable car which eased the cars up and down.

The decline was a reversed incline, hauling loaded cars up a hill instead of down. Both were constructed for the same reason of economy, with the decline sometimes being teamed with an incline (which became a double incline) to eliminate the need for a costly bridge or trestle across a canyon.

The introduction of wire rope in the 1890's made powered inclines practical. John Yeon, logging above the steep bluffs of the Columbia River, was one of the first to combine an engine with gravity. He developed a compressed air rig with a pair of hydraulic cylinders which used oil as the liquid agency.

From the earliest days of "dropping machines" and "log slide engines," it was to be expected that Western loggers would soon be outdoing each other to build inclines of superlative lengths, heights and grades.

The grade, or gradient of a railroad track is

the rate of ascent or descent. A level track is rated at zero per cent. One with a rise of one foot in 100 feet of track would be known as a one per cent grade. While the 45-degree angle of 100 percent is practically impossible, some of the logging railroads flirted daringly close to it.

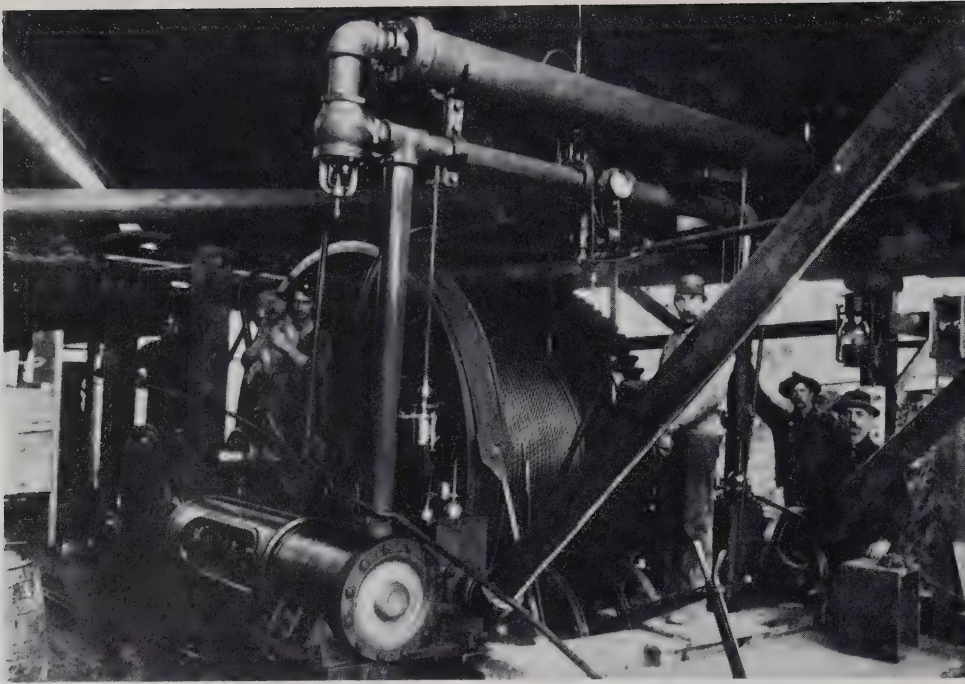
Grades of 60 to 70 per cent were used at one time or another by Marysville & Northern, Porter-Carstens Logging Co., Warnick Lumber Co., Roach Timber Co., Diamond Match Co. and Saginaw Timber Co. In 1930, West Oregon Lumber Co. leaned an incline against the hill at 74 per cent.

Wisconsin Logging & Timber Co. claimed the steepest incline of the day in 1916 when it built a 2,000-foot long cableway with a maximum grade of 66½ percent. Some of the glory was removed four years later when Basin Logging Co. created what it called the largest incline. It was 6,800 feet long, with a grade of 65 per cent.

"The steepest in the world" was the boast of Hogg-Houghton Logging Co. later in the '20's when it pitched an incline at 65 per cent. The title held until 1930, when Wood-Knight Logging Co. came up with an incline 6,600 feet long having a minimum grade of 20 per cent and a maximum of 76 per cent.

All such claims, no matter how valid, were shadowed by the mightiest incline of all time. It was built in 1912 by Yosemite Valley Railroad for its subsidiary, Yosemite Lumber Co. From a timbered crest 3,100 feet above the waters of the Merced River, a right of way slithered for 8,300 feet down the mountainside. Rocky outcroppings made it necessary to put in a curve and to slant the maximum grade at a breathtaking 78 per cent.

One car negotiated the drop every eight minutes carrying 30 tons of logs. Each of the 100 cars was specially built with a bulkhead at one end to keep the logs aboard. They were hinged



INCLINE OF YEON-PELTON CO. at Rainier, Ore., was the first successful adaptation of the powered cable railroad for logging. (Below) Loaded log cars were lowered three at a time by this huge compressed air rig. (Oregon Historical Society)



in the center with ball and socket plates to smooth out the humps.

Yosemite Lumber Company's triumph over Nature was in use only a few years before the surrounding timber supply dwindled. The incline rails, ties and engine were then moved to the west side of the river where they made up a cableway of lesser spectacle.

By the 1920's, several logging outfits had installed inclines which surpassed Yosemite's in length, but with only about half the grade. One was the gravity railroad of Bohemia Lumber Co. which stretched for two and-a-half miles. Another was High Point Mill Company's 9500-foot incline which used poles for rails.

Galbraith Bros. Logging Co. also had a pole road incline and built a special log-hauling car for the purpose. It had 14-inch wide wheels with double flanges to accommodate a track of six-foot gauge. Each wheel had six inches of side play to compensate for irregularities in the log rails.

Lyle-McNeil & Co. and Laird & Garrett were contemporaries with similar arrangements who helped to make a fad of the pole road incline in the mid-'20's.

In this period, a logger felt himself a failure if he didn't own an incline. Some unfortunates caught on flat ground were so embarrassed, *The Timberman* magazine relates, that they

went out and bought a mountain so they could build inclines and regain their self respect.

The mixed-up terrain of California's coastal redwood region was well-suited to inclines, where the long yarding methods, swings and sky-lines used in the pine and fir regions were often impractical. The logging manager of Northern Redwood Lumber Co. said in 1924 that "we intend to build enough inclines to permit us to yard in an area less than 1,000 feet, and load logs directly on the cars."

Nearby, The Pacific Lumber Co. was doing just that, using one decline and three inclines which aggregated nearly three miles in length.

Expensive as some of the inclines were to build, they represented the lesser of several evils. Hammond Redwood Co. put in a double incline in 1940 that cost less than one of the three bridges required if it had built a spur from the main line across the river.

A pair of electrically operated inclines installed by Diamond Match Co. in 1927 eliminated 20 miles of difficult road-building. Two inclines saved Basin Logging Co. a haul of six miles. One incline cut three miles off the haul for Roach Timber Co. and Wisconsin Logging & Timber Co. avoided four miles of switchbacks with its 2,000-foot vertical railroad.

Once installed, an incline saved the operator an average of \$1 per thousand board feet of logs hauled.

Sugar Pine Lumber Co. saved even more by rigging up a portable incline machine. Its two 750-ton electric motors were mounted on rail cars and could be moved from one incline site to another.

Because the sidehill railroad was sometimes the only means of reaching remote camps and settings, it experienced some strange commerce. Woods locomotives occasionally went up and down the incline, but not under their own power and certainly not with the crewmen aboard. They'd rather walk at a safe distance above the old coffee grinder, thank you, in case a cable broke under the strain.

If the woods camp was located beyond an incline, it meant that all supplies had to come up the roller coaster. Entire camps on wheels sometimes took the same precarious route.

The position of the camp in relation to an incline was of greater portent to the men who would have to travel over it to get to and from work or town. To some loggers, it was exhilarating sport to take the incline and look out on the timbered scenery from the slowly moving

escalator. It was a rare sensation to find oneself standing up while lying down. Others dug in with their caulked boots and hung on for dear life, a display of caution heartily endorsed by the logging operator. In not a few instances, job-seeking loggers were required to sign a waiver absolving the owner of accidents on the incline.

Aside from prayer, about the only overture to safety that found common usage was a signal system of some kind. The earliest version consisted of a team of young camp flunkies, who were stationed at intervals on the hillside. To stop, slow or start the cars, they shouted signals up to each other and eventually, to the incline engineer.

A refinement was the use of a steam whistle located at the power hoist. By means of a long cord paralleling the incline, the whistle punk could make his signals heard by the engineer in spite of the clatter of the hoisting engine.

A common practice was to string a pair of low voltage electric wires alongside the tracks. By shorting the circuit with an iron bar, the traffic control men could cause a bell to ring or a light to go on at the engineer's station.

At the top of Yosemite Lumber Company's first incline, an indicator was placed on the snubbing engine so that the engineer could keep track of his three-mile-long cable.

While runaways on the incline were inevitable, it was more often the presence of cables that caused concern. Should a break occur, the men working around the incline were confronted with an unpredictable steel snake with a sting of death that might lash out a half mile or more.

Because the cable received more wear on one end than another, it was necessary to reverse it from time to time. This could be a tedious and dangerous job. Temporarily unanchored cables were known to slip down the hillside of their own momentum, carrying some of the crew along.

Like the rest of the railroad show, the colorful inclines were gradually supplanted by truck roads, even in the redwood region. By 1950, not a single logging incline was in use. One of the few places where outsiders could get a glimpse of a working incline lasted until 1941. It was the 6,300-foot cableway of California Barrel Co., which crossed the Arcata-Redding highway on a trestle before climbing the hill at a 50 per cent pitch. It had become a tourist point of interest rivaling the many others in that scenic area.





INCLINE RAILROAD of Yosemite Lumber Co. (left) was the most spectacular of them all. Loaded log cars were lowered 8,300 feet down to the main line of Yosemite Valley Railroad, at a grade which reached 78 per cent.

THIRTY TONS OF LOGS came down the Yosemite Lumber Co. incline every eight minutes in cars hinged in the center to negotiate the humps and curves.

WALKING THE INCLINE was considered by some loggers to be safer than riding the cars. Man at left has the typical blanket roll pack of the pre-World War I era.

SESSOMS' LOWERING CAR was a variation of the incline railroad which eased itself down the hill by means of drums located in the log car and at the control station.

PILE OF JUNK is all that remains of Locomotive Number 24 which fell victim to a parted cable while trying to climb the Pacific Lumber Company's Perrott Creek incline.





RIDING THE INCLINE was an occupational hazard that faced loggers twice a day at many operations.

TRACKS TO THE TIMBER

A trip on a logging road was reminiscent of Evangelist Billy Sunday's Ford, according to a logger's joke of the '20's, because it shook the devil out of you.

Those who would complain about a sub-standard roadbed were told in salty language that the logging pike in question was not scheduling the Super Chief, and it seemed to be bringing in enough logs to keep the mill running. There was no other reason for the existence of most Western logging roads and thus no reason to overbuild. Economical construction was the everlasting priority consideration.

Aside from labor, rails generally represented the highest cost of putting in a railroad. Many early loggers economized by using wooden rails brought up from the mill. In some cases, the hauling in of heavy steel rails to locations distant from any railroad was a prohibitive expense.

"A few companies," wrote Fleming in *Narrow Gauge Railways in America*, "have availed themselves of wooden rails, made of hard maple, set into the ties, which are notched to receive them, and made fast by wooden keys. The rails are three and-a-half by six inches, and as long as they can be got, and are spliced with a lap joint, held fast by two bolts.

"The wear of the rails thus far has not been sufficient to furnish statistics in reference to their life," Fleming concluded in 1876.

Statistics weren't necessary for the railroad logger to reach the conclusion that his heavy loads called for more than wooden rails. One of the major disadvantages, as Lake Valley Railroad discovered, was that the wood wore down between the knots, making for a bouncing, lurching, stomach-turning ride.

Duncan Mills Co. was one of the first to use an innovation known as strap rails. Strips of iron about a half-inch thick and three inches wide were laid over its six-by-six timbered rails.

Arcata Transportation Co. stuck with strap rails until 1883, finally discarding them for all-steel rails.

C. C. Masten operated a geared locomotive on wooden rails until 1900, permitting the luxury of strap iron protection only on curves.

For nearly 60 years, there was usually a logger somewhere in the West who persisted in the use of wooden track.

One of the last and more heroic efforts to use the native product for rails was made in 1926 by Horton Lumber & Timber Co. The plan was a simple one. Series of 2x6 timbers, spiked together, were laid on the ground without ties or ballast. Because wear from locomotive wheels is hardest on the inside bearing surface of any rail, the three timbers were designed to be turned over and rotated. This provided up to 12 different bearing surfaces for each rail.

Basically, this was the Autorail System invented by A. W. Arnold in 1923, which called for the use of a converted truck locomotive. Rubber-tired locomotive wheels were recommended to assure traction.

E. J. Horton shunned the lowly truck and chose instead a conventional 14-ton Davenport locomotive.

Before the dark days of 1930 ended the enterprise, Horton had made a good start on his wooden railroad. The Depression caught him with two locomotives and 17 miles of track laid toward his goal of 22 miles between Junction City and the Lake Creek mill. Today the abandoned rails may still be seen on their lonely path into the Coast Range foothills east of Junction City.

Pole roads, which employed parallel logs for tracks, were another substitute for steel. They were used for logging purposes into the 1930's. Most of these inexpensive lines were laid without benefit of grading or ballast and boasted outsized gauges for better stability.



ROADBED OF LOGS was used when gravel fill was unavailable. Overstuffed little Baldwin narrow-gauge locomotive brings in a special order of timbers on the Yeon-Pelton Logging Co. line in the late '90's. (Oregon Historical Society)

But most loggers found the conventional type of metal rails to be the most efficient even for operations of short duration. And, after all, the steel or iron product could always be resold to another operator or the junkman.

Most lumbermen wrote off their experiment with timber rails as a loss, and switched to iron or steel as soon as they became smart enough or prosperous enough.

In the case of Caspar Lumber Co., a shipwreck near San Francisco in the 1870's provided the opportunity. The ship had gone down with a cargo of new steel rails from France, and the salvager offered the rusty lot at a bargain price because of their odd size and weight. No respectable railroad would buy the junk rails, but Caspar did. Crews were soon at work ripping out the lumber company's strap rails and laying down the French steel. While the replacement proved to be an improvement over wood, the exotic rails continued to develop flat spots until the line was abandoned in 1884.

Other bargains in rail were eagerly grabbed up by economy-minded loggers. American River Land & Lumber Co. made use of old street car rails from San Francisco, and Pelton-Armstrong Logging Co. laid down the tired old rails that had once graced the streets of Albany, Oregon.

There were other methods of cutting costs on rail.

Nearly \$30,000 in freight charges was saved by Snohomish, Skykomish & Spokane Railway in 1891 when it ordered brand new rails delivered around Cape Horn by sailing ship instead of freighted overland.

Used rail, called "relay," was commonly applied by the logger. It might have been 10, 20 or even 30 years old, but it was cheap. It would probably be usable another 5 or 10 years, or "as long as there was a streak of rust on the ground."

Spur rails, usually lighter than the logging main line rails, were picked up and relaid over and over on new spurs.

When Al Powers pulled the pin at his Minnesota logging camp and came to Coos County in 1908, he insisted on bringing his rails with him. They had been made in 1878 by Gorghum Co. in Germany. Minnesota & St. Louis Railroad Co. had made good use of them for 18 years before selling them to Powers. When the last of the relays were pulled up on the Smith-Powers Logging Co. line in the '20's, they had seen a rugged half-century of service.

Steel rails had replaced iron on mainlines by 1900, but the Seattle Steel Co. ran at capacity into the middle of the next decade, turning out 75 to 100 tons of iron rails a day for logging roads.

A common method of cost-cutting was the

leasing of rails from mainline companies. As the large common carriers replaced their old rail with heavier weights, the relay was profitably rented out to the logging lines along the right of way.

Locomotives became heavier over the years and the weight of rails had to be increased. Where 30 pounds to the yard was the average before 1900, weights of 40 to 50 pounds were the accepted standard 30 years later. Main line logging rails were usually heavier, and the surviving lines today use steel weighing 70 to 90 pounds or more.

Too many accidents were happening as the result of undersized rails when the California Industrial Accident Commission in 1917 came out with a regulation specifying a minimum weight of 30 pounds on logging spurs.

Logging Engineer Walter Ryan had a more specific recommendation. He told the Logging Congress that the minimum weight of the rail per yard should be not less than the locomotive

wheel load divided by 300. That meant that 60-pound rail would be safe for an engine of 54 tons and six drivers; or 72 tons on eight drivers; or 108 tons on 12 drivers.

Because loaded log trains move only in one direction, creeping rails have always plagued the log-hauling railroad. To add to the problem, steel rail will expand a quarter of an inch with a change of 100 degrees in temperature. While such temperature ranges are rare, a variance of even 50 degrees from season to season means a movement of a quarter of an inch at the points where two rails meet. Expanded rails, especially, were the cause of many a derailment on hastily constructed spurs.

A committee of the Pacific Logging Congress conducted a survey among its members who operated railroads shortly after World War I. Among the questions was one which asked, "To what extent and what kind of rail braces do you use?" Shining brightly among the prosaic responses was one from a haywire operator who

TRACK-LAYING MACHINES first appeared on logging roads about 1900. In spite of subsequent improvements, a good steel gang could often lay or pick up rail faster than a machine.



revealed, "I only put them in when the rail turns over more than three times at one spot. It has the habit by then," he concluded, "and it takes a brace to break the habit."

The habit was particularly noticeable on the Smith-Powers line. It had been built for many miles on steep hillsides, where sliding and shifting earth caused "running" rails. Twenty miles of it had been trestled, but even the trestle piling was vulnerable.

There's always plenty of wire rope around a logging camp, so Al Powers put it to use. Old cable was used to lash the trestles and rails to tree stumps on the sidehill above the right of way.

Reports of the strange lashup reached the chief engineer of Southern Pacific, who found an excuse to make an inspection trip.

"This is certainly a new idea," admired Chief Engineer Hood. "I have heard and seen a good deal, but it takes a logger to hog-tie a sliding country with baling wire."

Wandering rails were the cause of lasting embarrassment for personnel of Northwestern Railroad Co. In 1901, a private car carrying the line's directors derailed near Duncan's Mills. The train's speed had been too slow to cause any physical injuries. But there were mental sufferings when it was later admitted that rails on the curve had been fastened down with bent nails instead of track spikes.

More cautious operators resorted to a guard

rail on sharp curves. This was a third rail laid inside the running rail as a prevention against derailments. Rails of heavier weight were often laid as additional curve insurance.

"Our problem is not so much bending the rails," one timberman reported, "but straightening out the ones we have."

Rail-straightening developed into an industry of some importance in the West. A number of people made their living visiting logging camps and removing kinks, curves and assorted blights from the tracks.

Following such a treatment on one logging line, the crummy was making its first trip over the newly straightened rails. A logger, unaccustomed to the comparatively smooth ride, is supposed to have shouted to his companions, "Hit the brush! She's off the tracks!"

In addition to suitable rails, mainline railroad companies considered ties and ballasting to be essential elements of a proper roadbed, refinements which logging lines sometimes treated with indifference. A number of early operators dispensed with both alleged necessities by laying logs lengthwise on the ground and attaching rails along the top.

At the Youngs River camp of Crown Willamette Paper Company, a clever foreman once built a spur on air. He'd run out of flat ground at the spar tree and looked around for a place to maneuver his log cars. Nearby, he found a large tree growing up from the steep hillside below. The ends of two long logs were propped

POLE ROADS, such as this one in Western Washington, could be built at a cost of \$100 to \$200 a mile in the last century. Climax sold a number of its Class A locomotives with double-flanged wheels for use on the log "rails."





TRIPLE HEADING was necessary on Brooks-Scanlon Lumber Company's 50-mile haul into Bend, Ore. Grade reached a maximum of four per cent.

on the spar knoll and fastened at the other end to the tree. Ties and rails were added to the horizontal logs and the foreman had his new "end of steel" running 150 feet out into space.

On the spurs, most loggers would try to get by without ballasting. "We just let the locomotive engineer dump his ashes where he thinks they're needed to settle the roadbed," explained one operator.

Sometimes, ballasting material just wasn't handy. Even such well-financed operations as Clearwater Timber Co. found it necessary to lay poles under the ties because of the scarcity of ballast.

In 1923, C. R. McCormick Lumber Co. was enthusiastic about cedar slabs for ballast. The lumber mill trimmings were split up into three-foot lengths, an inch and-a-half thick, and slipped under the tracks as shims.

"Once in awhile the slabs mash down and the following year we add a few on top," Manager P. E. Freydid related.

As for ties, they were never hard to come by in the timber country, and may have been hewn at the site from trees on the right of way. Usually they were squared up, but were sometimes left in the round.

The immense problem of supplying ties for 100 miles of railroad faced Weyerhaeuser Timber Co. in 1927 before it could bring in logs for its proposed mill at Klamath Falls. With admirable Teutonic thriftiness, the company first built a portable sawmill on a railroad flatcar, then put it to work turning out the thousands of ties needed to start the larger operation.

The standard-sized tie of seven by eight inches will last from five to eight years on main-line service. Treating with creosote, zinc chloride or other preservative doubles the life expectancy.

This advantage was first explored in logging country by Diamond Match Co. They had been producing treated ties for Southern Pacific and in 1902 decided to try them on their own line.

Despite their proven superiority, treated ties were not widely used on logging roads. Replacement ties were handy and cheap and treated ties lasted no longer than untreated during their short, grueling life on logging spurs.

Ties were often picked up and relaid on new lines, although not as frequently as were rails. It was only during hard times that operators found the cost of labor in reclaiming old ties to be cheaper than production costs in securing new ones.

Ties were worth a dime apiece prior to World War I, and about 30 cents in the 1920's. They were often left to rot after the rails had been pulled, their only value being to provide the curious with evidence of the paths of the past.

On rare occasions, used ties had an intrinsic value. For a brief period at the beginning of World War I, Great Britain bought up large quantities for building trenches in France. Thirty-four years later, Union Lumber Co. sold its old redwood ties to a local manufacturer of architectural millwork.

How far apart he spaced his rails became another means for the logger to express his individuality.

The arbitrary standard gauge used by the mainlines had been determined 2,000 years ago by Roman chariot makers, and a large number of logging operators set out to improve on it.

"Our railroad may not be quite as long as some, but it's just as broad as any," was a favorite wheeze of the railroad logger. Some, however, overcame the implied shortcomings in length by resorting to exotic and superlative widths.

The term "narrow gauge" commonly meant a span of three feet between rails, although it necessarily applied to anything smaller than standard. The slim gauge logging lines came to full flower in California prior to World War I. Of the several hundred narrow gauge loggers in the West, more than half were located in California. It was largely due to the influence of yard-wide mainline roads that traversed the redwood belt.

The standard railroad gauge of four feet, eight and-a-half inches wasn't adopted by the major railroads of the country until 1886. While it affected those loggers having interstate carriers and interchange with large mainline roads, there was nothing mandatory about the measure for most of the woods lines.

When deviations from the standard gauge were built, it was for a number of practical reasons. Or so the builders believed at the time.

A king-sized distance between rails was thought by some to offer more stability to the train and to permit bigger loads on wider cars. Others supported the narrower gauges for the simple reason of economy.

Many of the strange gauges were inherited. Rolling stock purchased second hand may have perpetuated an earlier owner's version of the ideal gauge.

MALLET POWER was needed by Saginaw & Manistee Lumber Co. to tackle the eight per cent grade out of Bellemont, in Arizona's 9,000-foot high San Francisco Peaks area.

Arcata & Mad River Railroad's strange spread of 45½ inches was never duplicated by any other railroad. It was supposed to have been determined by the size of the handiest set of wheels available at the time. No doubt this was the casual method by which a few lines chose their gauge. But the likelier story of the origin of A. & M.'s unusual span is that it was the distance between stringers on a two-mile pier used by its horse-powered predecessor line.

When it was common practice to trail logs behind a locomotive, dragging the load over the ties, the wider gauges were useful in handling large logs.

Horses, and even oxen, contributed to out-sized gauges. Some operators used animal-driven railroads before steam power was practical. A gauge of six feet or more was necessary to permit the teams to walk between the tracks. When the switch was made to locomotives, the team-sized gauge was retained for convenience.

The huge size of some early homemade steamers, particularly on pole roads, accounted for other variations.

In 1871, a statistician reported that there were no less than 23 different gauges in use across the country. By the time that standardization came in 1886, the number of variations had reached 25. Most of them were found in the Western woods.

The early wooden rails of Duncan's Mills Land & Lumber Co. spanned five feet, five inches. Nearby, the Gualala River Railway topped that by three and-a-half inches.

Albion Lumber Co., a few miles up the California coast, won the local battle of gauges by laying its rails six feet apart—exactly twice the width of narrow gauge.



Seven-foot gauges were employed in the 1890's by Millet & McKay and C. C. Masten. In the late 1880's the Richardsons had three miles of seven foot, two inch gauge.

But the spread between rails was to reach masterful proportions in the Territory of Washington. It started with the pole roads around Puget Sound. As early as 1876, a steam locomotive was reported in Snohomish County which straddled log rails spaced eight feet apart. In 1887, *Poor's Manual of Railroads* revealed that eight-foot gauges were in use on Newkamp's Railroad and on Ulner Stimson's mile and-a-half line. The Olympia & Mt. Rainier measured in at eight feet, one inch, and the Jackson Logging Railroad stretched that another three inches.

What may be the all-time national record for gauge width was claimed by the Washington Mill Co. at Seabeck. Its line was two miles long and nine feet broad—three times wider than narrow gauge.

At the other extreme, W. R. Hawthorne ran his geared locomotive on a 21-inch gauge, probably the narrowest span for any steam logging road.

The compromise gauges presented some difficulties which eventually brought their downfall. It was hard to find used rolling stock to fit special gauges. It was a bother to convert them, and expensive to special-order them. Interchange with other railroads was impossible.

The loggers who wanted to keep their non-standard gauges—for reasons of sentiment, stubbornness or economics—found an answer in the addition of a third rail.

Diamond & Caldor Railway third-railed its yard lines to permit use by its own narrow gauge equipment as well as outside standard gauge cars. Sierra Nevada Wood & Lumber Co. did the same thing in 1907, having five narrow gauge and three standard gauge locomotives on its roster. McKay Lumber Co. and Sierra Lumber Co. struggled along with two different gauges at the same time—both narrower than standard.

Eastern & Western Lumber Co. in 1906 added a third rail in an attempt to harmonize its patched-up railroad system. The confusing result was four miles of standard gauge, six miles of narrow and six more miles of double gauge.

There was no easy solution for Diamond Match Company's California operations around 1910. The 20-mile Kimsheew Railroad, serving Diamond's Stirling City mill, used three standard gauge locomotives. The 20-mile line out of its Lyonsville mill used two engines on a three-

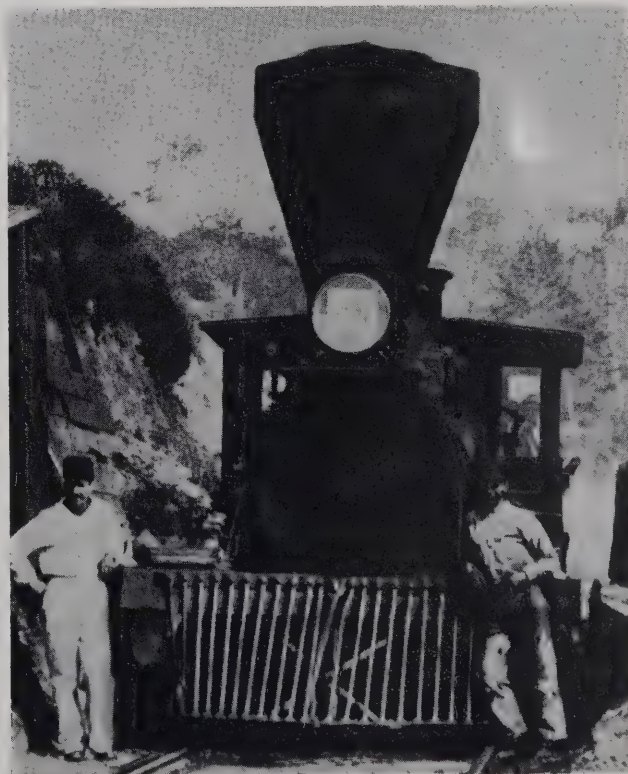
foot, two-inch track. And at its Red Bluff mill, four locomotives were operating on 15 miles of three-foot, three and three-quarters-inch track.

After Northern Redwood Lumber Co. had acquired Arcata & Mad River Railroad, the lumber company's logging super was given the chore of coordinating railroad operations of the two companies. Reluctantly, he ordered a third rail laid alongside Northern's standard gauge track to accommodate A & M's three-foot, nine and-a-half-inch gauge. In his monthly report, he confessed to the manager that he had just "bastardized eight miles of perfectly good Northern Lumber Co. track."

While the woods boss was technically correct—bastard gauge was the recognized term for a distance between meter gauge and standard gauge—it was another indication of the contempt loggers had developed for the bothersome special gauges.

Gradually the term "standard gauge" worked its way into the logger's language. It came to mean anything that was acceptable or better. The use of "narrow gauge" to describe such things as the boss, a camp or even a week-end in town, meant that the subject was below the logger's expectation.

BROAD GAUGE tracks set one foot wider apart than today's standard was not considered unusual by Gualala Mill Co. when this line was laid out in the 1870's. It was one of several dozen variations in gauges employed by Western loggers.





THIRD RAIL was commonly laid on curves as protection against derailment. Scene on Milwaukee Lumber Co. line in St. Joe National Forest about 1913.

TUNNEL at Crescent Lake on the Olympic Peninsula was one of the costliest ever built. The bore was driven for 460 feet through solid rock in the Government's hurried effort to obtain spruce for airplane construction during World War I. (Washington State Historical Society)



HOGS, GOATS AND IRON OXEN

To the logging operator, no worldly possession was more important than his locomotive. It was basic to the entire logging-milling complex and received whatever maintenance attention he was inclined to dispense or could afford.

Vital though the locomotive may have been, her busy smoke concealed some mysterious qualities that made her the object of many a love affair. No matter that she looked and sounded like a steel nightmare, was a bad steamer or had to take the grade backwards to prevent a dry boiler explosion. The logging lokey had a personality which made her the prima donna of the woods.

From the beginning, railroad men had endowed their engines with the feminine gender, and the tradition was continued by loggers. The engine was a "she," scissorbills or greenhorns were told, because it wears apron, binder, bonnet, cap, collar, hood, hose, jacket, muffler, petticoat, pumps, sash, shoes, sleeve, wrapper and yoke and eats twice what she's worth.

The logger was able to add another reason. His locomotives were called "she" because like women, they'd rather not admit their age after 20 years.

The chances were excellent that the age of any western logging locomotive picked at random would be well over 20. As one British observer put it, most of the motive power used to haul logs was bought "extremely second-handed."

Some of these jaded camp followers had more than half-a-dozen different masters, who paid successively lesser attention to appearance and maintenance. The average logging locomotive changed hands three times, making ancestry of little concern. Either the locomotive could do the job or it couldn't and records of her sale, exchange, foreclosure or scrapping were a sometime thing.

"Disposition unknown" must be chalked in the final column of the roster sheet for most of the West's logging locomotives.

Typifying the difficulty of tracking down their ownership history is the saga of a durable Baldwin product, built in 1870, which changed hands no less than seven times. Originally Virginia & Truckee Number 10, it came to the end of the line as Chambers Lumber Co. Number 2. City of Prineville Railway's Number 2 steam pot also had seven owners, including Brooks-Scanlon Lumber Co.

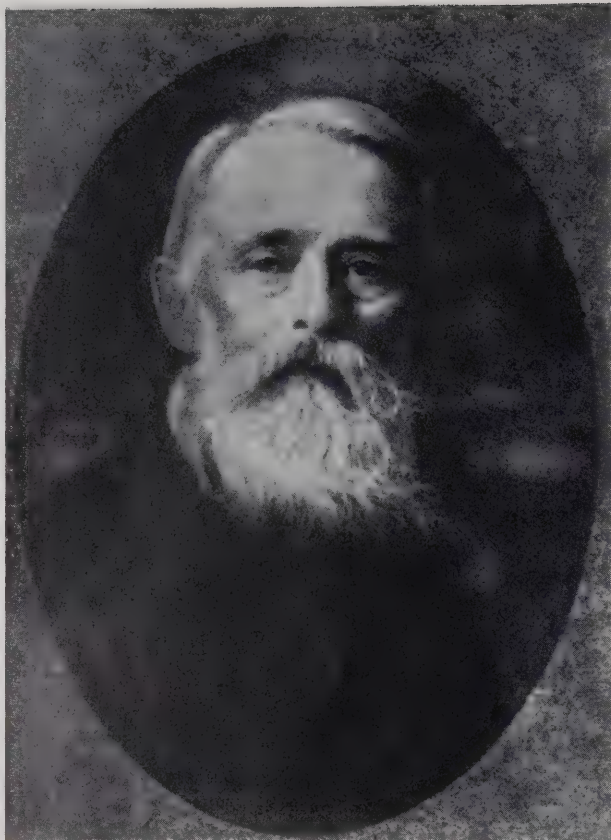
H. H. Martin Lumber Co. in the '20's was still using the "Gallopig Goose," a battered wanderer reputed to have had 10 previous owners. "The only original part of this 50-year-old wreck is the nameplate," reported Logger Frank Martin.

While older than most, Martin's patched-up hussy probably typified the logging locomotive. She was a cranky and unsightly hoyden with a deafening voice. Her "bandstand" was usually cluttered with wire rope, lanterns, tools and hose. An ugly, out-sized smoke stack added nothing to her beauty, although it helped cut down on the number of forest fires she caused.

Her driving wheels were smaller than those of her relatives on the mainlines and were usually de-flanged to minimize derailments. Side or saddle tanks were commonly applied to her boiler for greater tractive power.

When new, her 50 tons of steel had cost an average of \$10,000 in 1914, and about double that in the 1920's. Used locomotives cost whatever the operator wanted to pay. In 1900 Sierra Nevada Wood & Lumber Co. paid \$1,500 for the "T. R. Judah," the first locomotive to cross the Sierras. McCormick Lumber Co. in 1917 acquired "Sir Hugh," a pioneer Forney built for International Railway of Canada in an even-up trade for a carload of ties. An eastern Oregon operator came home from a Logging Congress poker-playing session with a 2-6-2 in tow.

She looks like a magnet dragged through the parts shop, was a common description of the woods lokey. The old girl had been around and showed it. Whatever she lacked in beauty was



EPHRAIM SHAY was the enterprising lumberman who revolutionized railroad logging with his lop-sided, geared locomotive. Although a total of 2,761 Shays were built between 1880 and 1945, Shay refused payment beyond the \$10,000 received for his original patents.

more than compensated by her usefulness, in which the logging locomotive had no equal in any other type of engine.

She was the most versatile piece of equipment in the woods, made all the more so by the logger's legendary ingenuity. At one time or another, the locomotive could be found trailing logs along the rails without cars, loading logs onto cars with a "parbuckling" wire rope arrangement and unloading them with a primitive "jillpoke" pressure system. Equipped with a cable and drum outfit on the pilot, the locomotive even acted as its own yarder, dragging logs from where they had been felled to the loading point. All such log-handling activity which is carried on today requires individual pieces of powerful equipment.

To "make her sit up and talk" seemed to be the logger's goal as he applied his locomotive to chores that even the manufacturer hesitated to advertise.

The narrow gauge engines of Lake Tahoe Railway & Navigation Co. were used as prime movers not only for logs but steamships. By the use of a block and tackle rig, the little locomotives were able to haul the heaviest of the lake

excursion steamers out of the water when it was time for repairs.

Goodyear Redwood Co. in the '20's was using a steam hose from the locomotive boiler to activate a piston plunger which pushed logs off the cars into the log pond. The Eufaula Co. borrowed locomotive steam to run its car-mounted loading engines.

Manufacturers of the Norby track layer boasted that their machine was economical because it utilized steam from the locomotive. The same source commonly supplied heat for the crummys that carried woods crews to and from work.

A happy woods foreman employed by Standard Box & Lumber Co. reported in 1916 that locomotive steam had been successfully applied to camp bunkhouses to rid them of lice, bedbugs and assorted insect-life. "That steam seems to get them coming and going," he beamed.

Boiler steam was used to operate pumps during road construction work and to generate emergency electricity for the mill and nearby settlements.

Fortunate employees of Smith-Powers Logging Co. had hot water each morning, thanks to periodic deposits from the locomotive tanks made in barrels alongside the tracks.

Boise-Payette Lumber Co. used locomotive power to drag sunken logs out of the mill pond. McCloud River Lumber Co. used boiler steam blown on the rails to get rid of hordes of caterpillars which seasonally stopped their log trains.

But good old "Daisy," "Bertha" or "Maggie" is best remembered for those occasions when her versatility made her a heroine of sorts. Often it was when she was used to pump water from a creek to put out a forest fire. Her air pumps might have been used to operate pneumatic tools on emergency repair work away from the shops. Her steam may have powered hydraulic pumps in clearing away the muck and rubble of slides. Or perhaps she had saved the lumber mill from fire by pumping water from the log pond.

The little narrow gauge dinkey of Loma Prieta Lumber Co. was given an ignominious part-time job that would make more prideful logging operators hang their heads. In summer months, she was rented out to the nearby Santa Cruz Beach Railroad and used to haul vacationing fun-seekers along the shore.

Many of the log-hauling locomotives were given names as well as road numbers. As might be expected, women's names were prominent on the roster. There was "Belle," "Tollie," "Peggy,"

"Betsy Jane," "Molly-O," "Old Huldah," and "Pansy," among others.

Some loggers attempted to add dignity to their operation by applying locomotive names such as "Defender," "Advance," "Hercules," "Excelsior" and "Trojan." What names their crews and logger passengers called the grandly named vehicles is not recorded, but it may reasonably be assumed that the impressive titles were not widely used in the woods.

As in the naming of racehorses, there was honor attached to having one's name bestowed on a locomotive. A few operators presumed to name their iron horses after themselves, but more often, personal names were those of friends, relatives or financial backers.

Place names provided a popular source of locomotive titles, as did the Indian influence. "Siwash" and "Skookum," "Santa Cruz" and "Mexico" reflected the wide geographical sweep of the western logging lines.

The operators were not impressing anyone with fancy names. The logging locomotive was usually a rolling junkpile, and a name like "Greyhound" or "Onward" added little to the efficiency of the operation.

A refreshing realism gradually crept into the practice of naming locomotives as "Old Blue," "Gypsy" and "The Coffee Pot" steamed into the logging camps.

To the everlasting credit of the logging railroad operators, the roster of official names also includes "The Jackrabbit," "Cyclone," "Blizzard," "Coffee Grinder," "The Ant," "The Grasshopper," "The Rattler" and "The Chippy."

Invoking the magic name of an influential politico of the day brought no good fortune to Sierra Flume & Lumber Co. in 1881. Its Number I locomotive, bearing the name of a California capitalist on its sides, was delivered to the Lyonsville camp by horse and wagon. Union Iron Works of San Francisco had incorporated the latest refinements in its product, in keeping with the elegance of the new locomotive's name-sake.

At the end of the logging season, the manager of Sierra had brought Union Iron Works to court. He claimed that Union was guilty of manufacturing a shoddy product. The engine was so inefficient, he charged, that the operation lost money. This insult to the great man of the day whose name appeared on the locomotive was avenged by a local court, who agreed with the lumber company.

The decision against Union Iron Works was

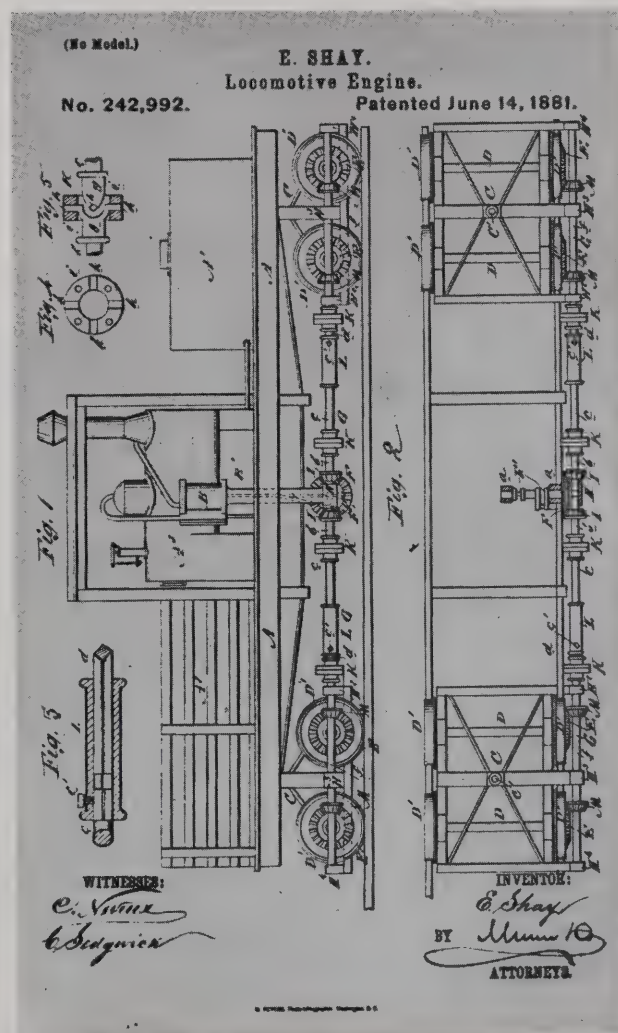
later reversed by the Tehama County appellate court, but the incident was significant: the steam engines of the day were not keeping pace with the increasing demands of logging work.

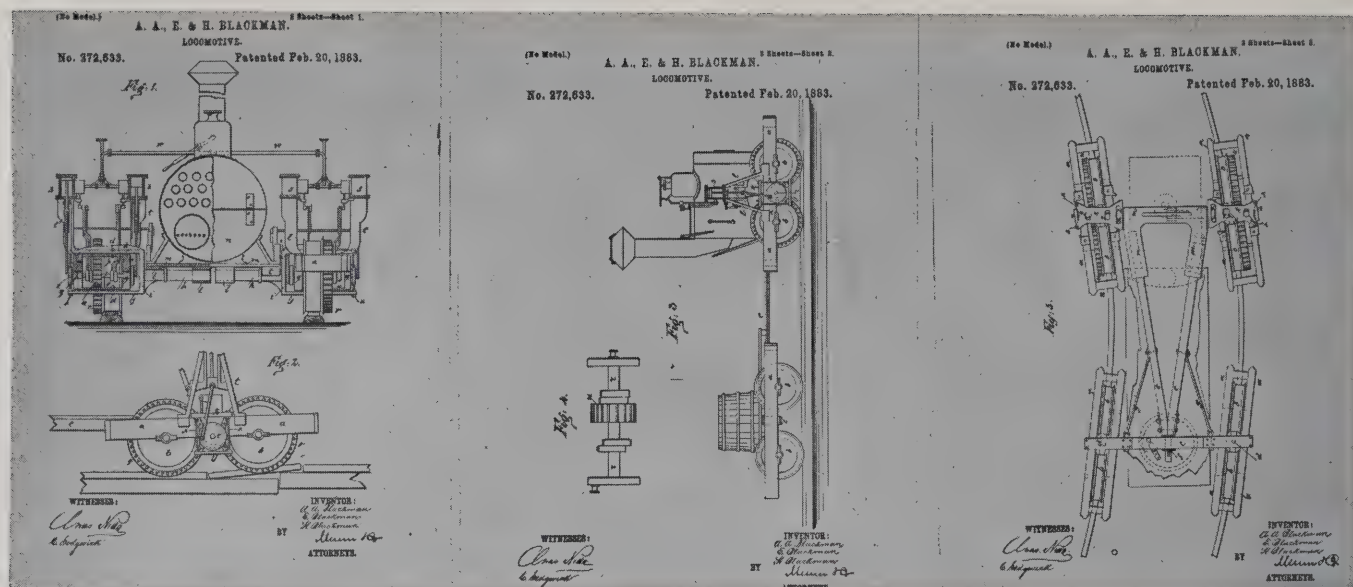
While the logging operator was able to make intensive and lasting use of the Consolidations, Moguls, Pacifics and several dozen other breeds of rod-type locomotives purchased second-hand from the mainline railroads, he found them lacking a number of qualities needed for severe spur line service.

One who had observed the shortcomings at first hand was Ephraim E. Shay, a rugged, broad-shouldered logger of Haring, Michigan.

"Business was dull in the 1870's," Shay related, "and I was compelled to reduce logging costs or quit. Logging cost \$3.50 per thousand board feet from stump to mill, using horses and logging wheels."

SHAY'S PATENT in 1881 shows basic simplicity of the side-shaft geared locomotive. Only one cylinder was used in this early version. Two-cylinder models were made from 1881 to 1884, and three-cylinders were standard thereafter.





BLACKMANS' LOCOMOTIVE was the second major effort to apply geared power to logging. The Blackman brothers had unusual mechanical ability and developed their locomotive without having seen a Shay or any other geared type.

Shay built a maple-railed tramway, using horses for power, and reduced his costs to \$1.25 per thousand. "But the cars would catch the horses on down grade and sometimes kill them. Brakes were impractical. I finally concluded to try a light locomotive, and with the help of a local repair shop, did so."

Shay's first engine, while lighter, was built along conventional lines, and the pounding of its rods soon tore up the wooden rails. Surprisingly, the loaded log cars weighed twice as much as the locomotive, but did no damage to the tracks.

Shay reasoned that if he could relay power to trucks similar to the log car wheels, the track-punishing effect of rod drivers could be eliminated.

While snow covered the Michigan woods during the winter of 1872, the bearded tinkerer worked on the idea in his home workshop. The following spring and for subsequent seasons, Shay alternately used his geared engine and improved it. By 1879, only the cylinder remained of his original locomotive.

"All of this work was done by me and my lumber mill blacksmith," Shay revealed, "and was crude in the extreme. But it drew logs from anywhere and all places, saving much labor from teams and was extremely profitable.

"My friends remonstrated with me for spending so much time and money on such a crazy idea, and in fact, they really thought I was a little cracked, and did not hesitate to say so."

But Shay was to revolutionize the business of logging. His geared locomotive and the competing types it inspired made efficient log-haul-

ing possible in forests where rod locomotives could not venture.

Messrs. Carnes and Agerter of the Lima Machine Works had been watching Shay's experiment with interest. They had built a couple of locomotives themselves, and in the late '70's had produced a few parts for what the local loggers were calling "Shay's Folly." Yet even the alert proprietors of the Lima concern were shocked when they first viewed the rolling monstrosity that Shay was now suggesting that they manufacture in quantity.

The pilot model of the locomotive that was destined to become respected around the world consisted of a short railroad flatcar with a wooden water tank at one end, a wood bin at the other and an unsightly assortment of machinery surrounding an upright boiler in between. What's more, the thing was lopsided, with the boiler on one side, and geared transmission machinery on the other.

"One consoling feature," Shay later wrote, "was that I was making more money from its use and I could get more for my timber than my neighbor mill men. My customers knew that rain, bad roads, etc., did not deter me from logging."

The logic was evident to the proprietors of the Lima works and in 1880, the first factory-built Shay geared engine was sold to J. Alley Co. for \$1,700. Three Shays were built that year.

Until 1885, all Shays were two-truck types, with geared power transmitted to the four driving wheels on each truck. A three-truck model was then added to the line and the upright boiler

was modified to a boot shape with flues running through the horizontal part which faced the rear.

The Shays were still limited to less than 20 tons in weight—just about heavy enough to mash a finger, scoffed the supporters of rod locomotives.

There were nearly 200 stemwinders snorting around the eastern woods in 1888 when Climax Manufacturing Co. of Corry, Pennsylvania, sold its first geared locomotive and ended Lima's monopoly. The endless argument over which was the best geared engine was now under way.

The earliest Climaxes were similar in appearance to the Shays, except that the cylinders and driving machinery were centered. Later models looked more like a conventional rod locomotive. On each side of the boiler was a cylinder mounted parallel with the track, but inclined toward the ground at about a 45 degree angle. The pistons drove a crankshaft running crosswise under the boiler. Through a master gear, power was transmitted to a longitudinal center shaft and through bevel gearing to the wheels.

For more than a decade, double-flanged wheels and corrugated wheels were offered as optional equipment in an overture to loggers using wooden rails and pole roads.

The Climax was a cheaper product, but the Shay's head start put it well on the way to becoming the Model T of the woods. By 1893, the 450th Shay was outshopped and placed on dis-

play at the World's Columbian Exposition. Before the gates to the fair grounds closed for the last time, another competitor for the geared locomotive market was born.

Charles Heisler's first locomotive was produced at Erie, Pennsylvania, and sold in 1894. It could not claim any improvement in looks over the Shay, but as a Heisler advertisement of the day pointed out, "the load is equally distributed on the main frame instead of one-sided." Heisler had hit the Shay at its most vulnerable point—the Lima product pounded the daylight out of the cylinder-side rail, leaving the boiler side of the tracks little-touched.

The two-cylindereed Heisler had a pair of pistons opposed in the form of a "V" located at each side of the boiler. Unlike the Shay and Climax, its gears ran in oil within sealed housings. The number of gears was reduced by having only one axle in each truck geared to the main driveshaft, with power transmitted to the other axle through side rods connecting the two pairs of wheels. A Heisler could start off on a 10 per cent grade with a load of 111 tons.

With the entry of the Heisler, essentially all the participants had lined up for a 50 year race for the logger's favor. The locomotive manufacturers now began a bitter struggle for the lucrative new market which their products had made possible.

In an obvious attempt to blacken the eye of Shay's reputation, the Porter works advertised that "our locomotive looks you straight in the



"OLD BLUE" of Pokegama Sugar Pine Lumber Co. proved to be a disappointment in 1897 after being hauled 30 miles up the Cascades by freight team. Not powerful enough for log-hauling duties, she was used only to take empty cars back to the woods. Loaded cars were routed to the Klamath River log chute by gravity.

eye." Davenports were billed as the ideal logging locomotive for all conditions. Baldwin claimed the best of everything for its rod engines, while American modestly pointed to dependable haulage. Vulcans, it was said, offered the logger "an elegant opportunity."

"Per ton of locomotive, the Climax will haul the greatest number of cars of logs on steep grades," continued the argument. It was a feature claimed at one time or another by five different manufacturers.

A major skirmish of the war was fought out at Portland's Lewis and Clark Exposition in 1905. The gold medal for excellence was awarded with much fanfare to a Baldwin locomotive. Representatives of the rival Lima Locomotive & Machine Co. were furious, charging among other things that the chairman of the jury was a harness-maker.

Harrassed Exposition officials let Baldwin keep its gold medal, but appointed another set

of judges which thoughtfully included several Shay supporters. The result was the award of a gold medal, superior jury, to the Shay.

No matter what the claims and counter-claims of the manufacturers, it was performance that interested the logging operator. Numerous improvements to the locomotives—both geared and rod—were made over the years to keep pace with logging operations that pushed back into increasingly difficult terrain.

The manufacturers of rod locomotives had moved the water tank up from the tender to tanks beside or over the boiler. These side or saddle tanks provided added weight above the driving wheels. Driving wheel diameter being a factor in tractive power, the size was lessened to meet the demands of logging work.

Typical of the improvements was Baldwin's Sequoia type. Among other advantages, it had 25 per cent more heating surface than earlier models. Its first users, Polson Logging Co.,

LOCOMOTIVE NUMBER 5, the "Tollie" of Simpson Logging Co. (left), was delivered in 1896 and became one of the first two Heislors to be used in the West. Another new 45-ton Heisler was acquired at the same time by the Blakely Railway Co.





CLIMAX LOCOMOTIVE had a pile-driving action that earned it a reputation as a bucking brute. As Yeon & Pelton's 1902 model shows, it had less moving parts than a Shay and was easier to maintain. (Oregon Historical Society)

Weyerhaeuser Timber Co. and Peninsular Railroad Co., found that it could handle 6 per cent grades and 36 degree curves.

The Shay, by means of a series of universal joints in its underpinnings, could still best its competitors in curve-taking. It could snake around a curve so sharp, went the rumor, that its headlight would shine over the engineer's shoulder into the firebox.

In an attempt to keep both sales and product on the track, Baldwin adapted the articulated and articulated compound locomotives for log-hauling. The principles were combined in the Mallet, which had two sets of driving wheels. High pressure steam to power the rear set and low pressure for the front came from the same boiler. The leading set of frames, cylinders and driving wheels was independently mounted, supporting the front of the boiler by a pivotal arrangement. This effectively reduced the rigid wheelbase, but gave the articulateds the illusion of going in two directions at once while rounding a curve.

A 61-ton Mallet acquired by Caspar Lumber Co. in 1909 became the first to be used in logging anywhere. It was so powerful, volunteered an observer, that it could haul in one train the entire annual log output, the annual mill output, and a whole week's supply of beans for the camp.

Booth-Kelly Lumber Co., Whitney Co. and Columbia River Belt Line Railway bought new articulated compound wood burners in 1910, and the Mallet's reputation as a log-hauler was soon established. Baldwin's advertisements had proved accurate when they described Anatole Mallet's innovation as powerful, flexible and easy on the track.

Baldwin turned out a pair of narrow gauge Mallets for Uintah Railway of Utah which later spent a good many years hauling logs and lumber on the Sumpter Valley Railroad, an associated company. They were the only narrow-gaugers to be used in this country.

The Mallets focused the logger's attention on the benefits of increased power.

The one-horse Shay was all right in its time, quipped the editor of *West Coast Lumberman* in 1910, but nothing less than a forty-horse Shay goes now.

The Lima works had souped up its product with a third cylinder in 1884, and during the first decade of the new century, came out with heavier, more powerful models reaching the 150-ton class. These were four-truck Shays with a total of 16 driving wheels. But the end of the line was near for the Shay patents. The rights to produce Shay's "rolling corkscrew," for which Carnes and Agerter had paid \$10,000 in 1880, had expired in 1922 when Willamette Iron & Steel Works of Portland began production on an undisguised copy called the Willamette Shay.

The Oregon product was inferior to the original Shay and required extensive re-shopping. Only 33 geared locomotives were sold by Willamette before it gave up the business seven years later. But the threat of competition had goaded the Lima people to action.

The first "improved" Lima Shay was unveiled at the Pacific Logging Congress of 1927. Except for being a foot longer, there was little difference in outward appearance over the Shays that had been in the woods for decades. Lima had enlarged the firebox and grate and added superheaters among a number of other minor changes. The new 70-ton model had about 25 per cent more tractive power. With an eye to their potential market, the Lima people had named it the Pacific Coast Shay.

As the West's logging railroad mileage neared its peak, other locomotive manufacturers joined the battle.

Heisler in 1928 brought out its "West Coast Special." It was "guaranteed to show more power than any other locomotive—and faster!"

Porter tried to steam up enthusiasm among loggers for its fireless locomotive in the '20's. The clean-looking unit did not generate its own steam, but borrowed it from lumber mill boilers or a similar stationary source. Even though it reduced fire hazards in the woods, the loggers shunned it after The Pacific Lumber Co. found a pilot model to be inefficient.

Davenport jumped into the fray with its own version of a geared locomotive in 1924. The first railroad steam engine in America had been a geared model, and nearly a hundred years later, Davenport attempted to use the principle to bolster its lagging sales of rod locomotives. Its Forney-type unit had driving gears housed in oil, as well as a two-speed gear shift arrangement. It became the eighth important effort to produce the ideal geared locomotive.

The geared Davenport was a flop, as were many predecessors which attempted to make railroad logging easier or cheaper.

Even the venerable Baldwin Locomotive Works headed for the geared engine market and failed to make the grade. Between 1912 and 1915, Baldwin produced five of its two- and three-truck geared locomotives, which were similar in appearance and operation to the

MIKADO TYPE locomotive was popular as a main line log-hauler because of its power and excellent tracking qualities. Number 1 of Weyerhaeuser's Klamath Falls operation was a 70-ton Baldwin built in 1912 for Twin Falls Logging Co.





LOG DUMP of Storey-Keeler Lumber Co. featured a canted track which aided removal of logs from cars. Wood-burning locomotive is a Climax Class A. (Oregon Historical Society)

Climax. The only one which found its way West was bought in 1913 by Montesano & Northern Railroad.

Another well-financed venture was the geared entry of Brooks Locomotive Co., through its short-lived subsidiary, Dunkirk Engineering Works. Their Gilbert-designed locomotive was a cross between an early Climax and a Heisler. Less than half a hundred were produced between 1890 and 1894, of which only two were sold new to western logging outfits.

Another promising geared locomotive patented by Oscar Hopkins of Idaho never saw production.

While Shay had been putting the finishing touches on his contraption in the late '70's, other tinkerers located 2,000 miles away were performing remarkably similar experiments.

As early as 1875, the Blackman brothers had toyed with the idea of a "steam car" to haul logs to their Marysville, Washington, mill. Like Shay's first model, it turned out to be a flatcar converted to a locomotive by the addition of a vertical boiler, water and fuel storage and geared wheels. The Blackman version ran on wooden rails spaced seven and-a-half feet apart.

It wasn't until early 1882 that the word of Shay's engine reached the woods of Puget Sound. The Blackmans hurriedly applied for a patent on their geared model in August of that year—14 months later than Shay received his patent. There's no question that Shay's vertical cylinder was superior to the Blackmans' clumsy cog-wheel arrangement, but the Shay wasn't introduced to the West for many years. The Blackmans produced 30 geared steam cars be-

fore the arrival of the Shay and other improvements made them obsolescent.

The innovators never ceased. T. W. Garbutt of Georgia believed that he had the answer in 1898. It was a "very simple locomotive that could be readily handled by the men in the logging camps." An eye-catching feature of his product was a pair of cylinders that swung back and forth like pendulums.

Two years earlier, Barney & Smith Car Co. of Ohio brought out the first "convertible" in the timber industry. Looking more like a monstrous hay-mowing machine than a locomotive, the 30-horsepower behemoth could be run on a pole road, iron track or bare ground. Despite the fact that the versatile engine could also be used to power a small sawmill, the "Steam Missionary" as it was called, never made a convert.

Several western logging operators welded standard rod locomotives back to back in an attempt to obtain twice the power from one unit. The double-breasted engines were handy on a track system without wyes or turntables, but eventually proved to be more nuisance than they were worth.

The all-time championship for the most outlandish machine in the woods is claimed indisputably by the Fouts Grip Wheel. Like the Walking Dudley which preceded it by a few years, the Grip Wheel employed a vertical steam engine mounted on a flat car. By means of a huge wheel, the monster winched itself along a cable anchored at either end of the tracks. Henry Colvin of Oregon was the first to use a

Fouts in 1898 and successfully trailed logs behind it at a grade of 28 per cent.

A year earlier, a disillusioned Simpson Logging Co. had converted the last of its six Duddleys back to a flat car.

J. H. Dotterer of Ostrander, Washington, came up with a workable logging locomotive in 1934 that had two sets of driving wheels pivotally mounted to each end of the frame. It was similar to a 50-ton model that Vulcan Iron Works had first offered to loggers in 1931. But the early '30's was no time for such ventures. More than half the Nation's lumber mills were shut down and logging railroads were on the decline.

American Locomotive Co. made a late attempt to keep the rod locomotive in the woods. In 1923 it began production of a Mikado-type unit with four sets of driving wheels. The 2-8-2 was the most powerful single-expansion, two-cylinder, saddle-tank locomotive ever built. Weighing in at 130 tons, the trim American could take 28 degree curves and 8 per cent grades. In honor of Sugar Pine Lumber Company's Minarets & Western Railroad, which bought the first 10 models, it was called the Minarets type.

No one had ever seriously disputed the superiority of geared versus rod locomotives for strenuous woods duties. The rock crushers, so-called because their exhaust came four times faster and louder than rod models, were slow but powerful. An incidental advantage was that in their slowness they were less inclined to be involved in serious accidents.



FOUTS GRIP WHEEL locomotive was the most awesome piece of machinery in the woods. Like the earlier "Walking Dudley," it winched itself along a cable, trailing logs behind. This double-flanged wheel model was used by Henry Colvin at Marshland in 1899, where it negotiated a 28 per cent grade.



GEARED MONSTER was developed by the Blackman brothers in 1881. It was reputedly the first locomotive built in Washington Territory and the first to be used in Snohomish County. Its gauge was seven and-a-half feet. Other Blackman models required wooden rails spaced up to nine feet apart.

The Shays, Heislars and Climaxes had a steadier pull than the rod models, derailed less frequently, and because of their more uniform exhaust, steamed more freely and consumed less fuel. Geared engines were as much as 11 per cent quicker and more accurate in spotting cars and took about 20 per cent less time in attaining a speed of 10 or 15 miles an hour. They were able to negotiate sharp curves, rough roadbeds and light rails. For a clincher, the cost of operating a geared locomotive was around \$18 per hour, compared with \$22 an hour for a saddle-tank rod model.

While all concerned agreed that the noisy, gear-driven engines were superior to direct-connected ones for most woods chores, the argument over which was the best geared locomotive has never ended. For more than half a century, the subject has endured as conversational material among partisans in the Tacoma Clubs, the Erickson's Saloons and camp bunkhouses.

The Climax had a simple design, some said, but was the least efficient, said others. The Heisler was poorly built but there was no power loss through the gears, went the commentary. The Shay's gears, being exposed, were more subject to damage, but easier to reach for repairs, continued the argument.

The operators backed up their opinions with cash. Simon Benson bought seven new Shays at once in 1901. West Side Flume & Lumber Co.

a year later bought three new Heislars, making a total of five on their roster. Mutual Lumber Co. bought seven Climaxes in as many years.

White River Lumber Co., El Dorado Lumber Co. and Weyerhaeuser Timber Co. were among the undecided ones. Each was using a mixed bag of all three makes of geared locomotives at the same time.

The Climax works folded in 1928, with a production record of just under 1,000 locomotives in 40 years. Its last 70- and 80-ton models were delivered to McGoldrick Lumber Co.

The highball days were just a memory to the Heisler Locomotive Works when it outshopped its last locomotive in 1945.

The argument over which was the best geared locomotive had been won decisively by the Shay. When the last stem-winder left the Lima works in 1945, it represented the 2,761st vote of confidence in "Shay's folly." Climax, Heisler, Baldwin, Davenport and a dozen other manufacturers had tried to improve on the bearded logger's product, but never came close.

There were other innovators who felt that steam could be replaced as a power source by something cheaper, handier or more efficient.

"Within a few years," the editor of *The Timberman* told his readers in 1920, "the electrically operated logging railroad will not be uncommon." In its favor he cited the elimination of the fire risk and freedom from the water supply



WEST COAST SPECIAL was Heisler's answer to the Pacific Coast Shay, the Willamette Shay and other improved types that came along in the 1920's. The first of the new Class 90's was delivered to West Fork Logging Co. in 1928. The 90-ton Heisler outlived its producer by more than a decade before it was scrapped in the late '50's.

problem. Fourteen years later, the electric logging railroad mileage totaled a mere 17 miles, but the editor was still optimistic.

"The electrification of logging railroads will be stimulated by the development of cheap power at the Grand Coulee and Bonneville dams on the Columbia River," he insisted.

Puyallup Valley Lumber Co. tried one of the juice jobs as early as 1906, but soon traded it in for a Climax. Western Lumber of Montana had similar misfortune with a new one bought to haul logs in 1912.

A large network of electrified lines crept over the Willamette Valley of Oregon between 1905 and 1920. While these flatland roads carried mostly logs, they were controlled by utility companies or mainline public carriers. Up in the hills the electric locomotive had proved to be underpowered for most logging work. In addition, it lacked variable speeds and required a large source of handy power.

The die-hard defender of the electric logging railroad was Red River Lumber Co. After taking delivery of a new electric locomotive in 1926, it kept electrics rolling for 20 years on its 17-mile Red River Railroad. The loyalty was inspired by the availability of cheap power from nearby power stations.

After 40 years of experimentation in the western woods, it became clear that electric locomotives had only one distinct advantage: a savvy engineer could provide hot coffee to the crew from electric urns hooked up to his power plant.

Try kerosene locomotives, Westminster Iron Works advised in 1920, and discover "a solution to your logging problems." The 7,000-pound dinkey they advertised could be used either on rail or poles.

Converting Fordson farm tractors to pole road locomotives was a big business for Skagit Steel & Iron Works in the '20's. A fad for con-

verted truck locomotives hit central Oregon at the same time when at least a half-dozen loggers tried rail-borne gasoline trucks. Cameron Lumber Co. welded two Whites back to back so that in the absence of a loop or turntable, the "engineer" need only switch seats and crank up the other motor to run his log train in the opposite direction.

Heisler was running third in the race for the geared logging locomotive market when it brought out its Diesel electric in the late '20's. The 60- and 80-ton models were supposed to combine the pulling power of steam geared engines with the economy of oil, but only a few hybrids were sold before the Depression brought production to an end.

Plymouth Locomotive Works sighted in on the loggers when it offered its first Diesel-powered, gear-driven unit in 1927. With four cylinders and 77-horsepower, it had four forward and four reverse gears. It found favor as a low-cost, light-duty locomotive, and a few of them remain in use today as switchers and mill hogs.

Plymouth also came out with a gasoline-powered logging locomotive at the same time.

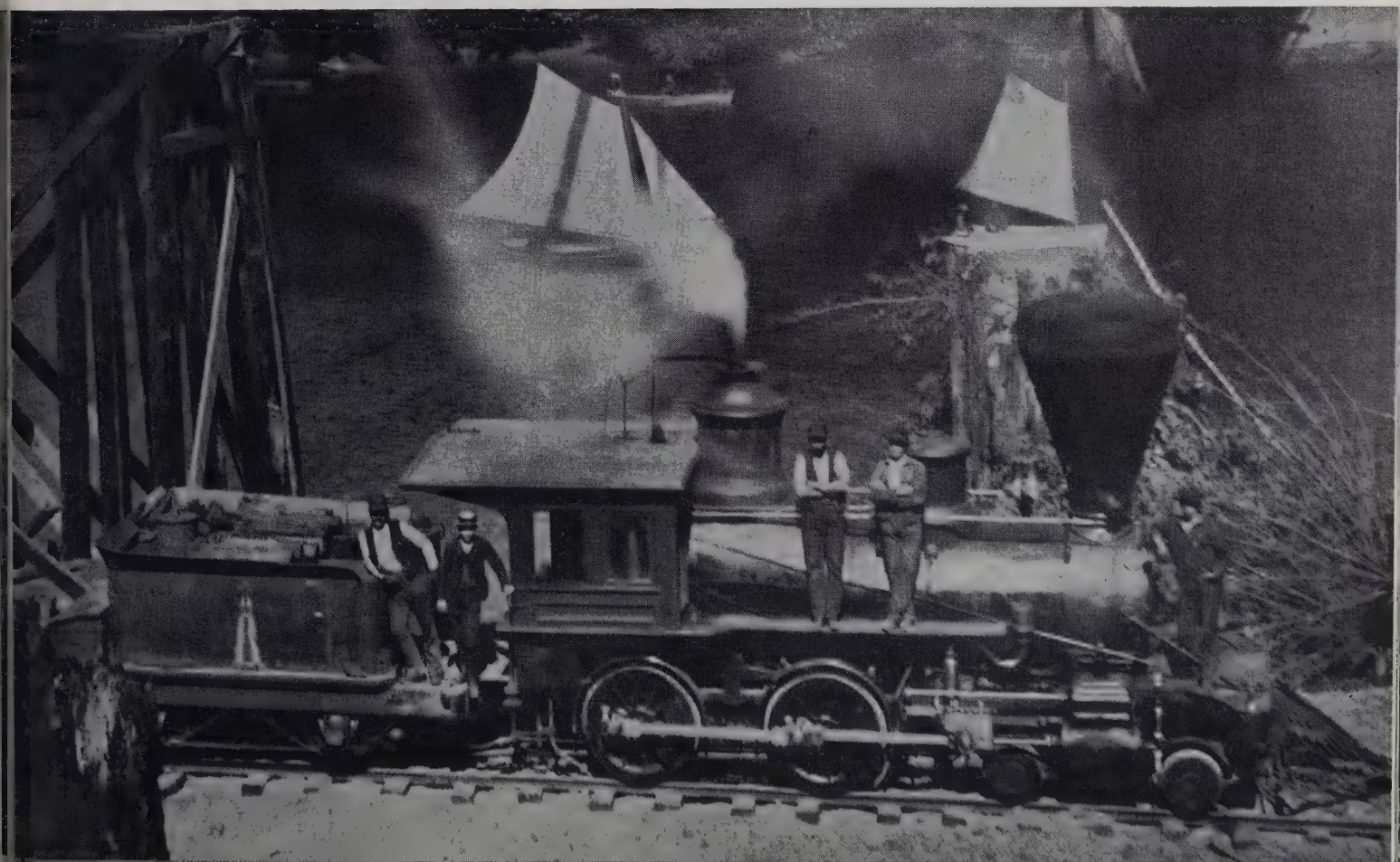
E. C. Olson was the first to try them out at his Idaho operation in 1927, and reported that his pair of narrow gauge models, unlike steam locomotives, were always ready to go. A major economy was the need for only a two-man crew. Madera Sugar Pine Co. bought a 20-ton model for track-laying.

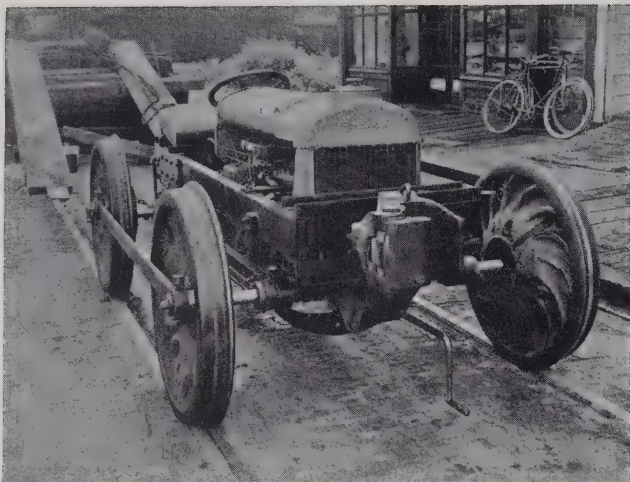
The gas jobs were "as handy as a pocket in a logger's shirt," testified Merrill & Ring's woods boss, who pointed out that any logger could learn to drive one in a few hours.

Wilson & Olson in southwestern Washington were among the first to try a gasoline locomotive in 1902. Hobart Estate Co. found their 1908 Milwaukee three and-a-half ton model so successful that they bought a second in 1910. Fourteen years later, Hobart added a Milwaukee six-tonner which proved hefty enough to push through the High Sierra snows.

"There is undoubtedly a coming larger use for gasoline locomotives in logging and lumber operations," spoke the inevitable prophet for any innovation in motive power. In this case it was the logging superintendent of Cady Lumber Corp., whose 1928 prediction never came true.

AMERICAN TYPE locomotives with four driving wheels were the most widely used model in the western woods during the last century. The 4-4-0 above was made for Gualala River Railroad in 1881 by Union Iron Works of San Francisco.





CONVERTED TRACTOR locomotive found brief popularity for light log-hauling duties in the 1920's. As more powerful Diesel locomotives became available, the flange-wheeled Fordsons and Holts were returned to the farm.



The use of gasoline-powered logging locomotives was at its peak at the time, with a couple of dozen loggers listed among the 300 users on the Pacific Coast.

When Red River Lumber Co. added the first Diesel locomotive west of Chicago in 1926, most of the industry's prophets were cautious. "Loggers are watching its performance with interest," ventured *The Timberman*.

A year later, Ira Withrow of Polk Operating Co. was saying that "there is no question that the Diesel is the coming power in the woods. It saves the expense of water, reduces the fire hazard and the fuel cost is much less than wood."

He had summed up neatly the major reasons why Diesel was to gradually replace steam in the next 20 years. Cold economic facts were closing in on the steam engine.

The Interstate Commerce Commission estimated in the '20's that fuel costs amounted to about 40 per cent of all operating costs on common carriers. On logging railroads, the percentage was probably higher.

The earliest logging locomotives had been wood-burners, with obvious economic advantages to the timberman. Labor in getting wood to the locomotives was a major cost item, however. It took an average of nearly four cords of wood each day, for example, to keep steam up in the locomotive of Eel River & Eureka Railroad in the '80's. Fireboys on Sumpter Valley Railroad chucked as much as five cords into the firebox on a one-way run of less than 100 miles.

After dumping their logs, trains returning to the woods often carried the next day's fuel supply of slabs from the mill piled high on the log cars.

"On steep grades, firemen threw in wood so fast it popped right out through the stacks," according to Old-timer Dave James, "and sometimes stunned grazing cattle a hundred feet away."

Coal was available in many parts of the West but found limited popularity in logging engines. Several lumber outfits in the coal country of Oregon and Washington maintained company-owned mines to feed their hungry charges.

There was some doubt for Kent Lumber Co. in 1921. With only three locomotives, it fueled one with wood, one with oil and one with coal. The opportunity to compare the relative merits of each source of power was equalled only by Bloedel-Donovan Lumber Mills, which at the same time was using oil, coal, wood and gasoline.

Heisler's new three-truck locomotive came out in 1912, suitable either for coal, coke, oil or wood.

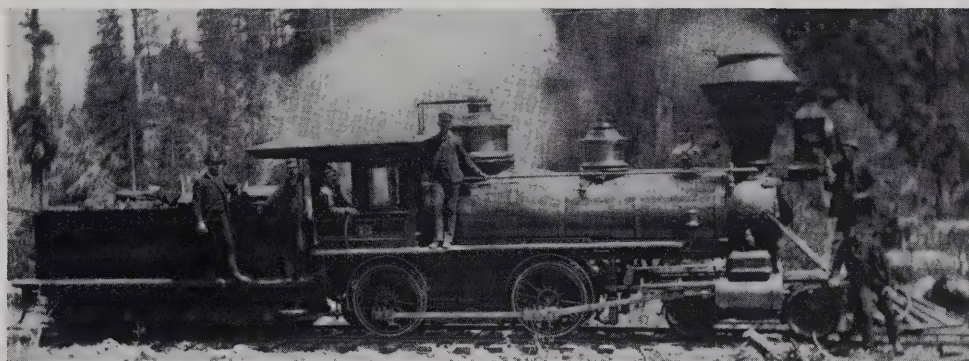
A few operators tried coal briquettes. Home-made charcoal briquettes were used by Wallace Lumber & Manufacturing Co. to keep its pair of geared locomotives going for years. For them, the briquettes had the same advantages which would later appeal to the backyard barbecue cook: steady heat with no sparks and little smoke.

But all factors considered, petroleum was still the West's prime fuel. And it caused fewer fires in the woods. Southern Pacific placed its first oil-burning locomotive in service in 1895. Union Lumber Company's California Western made the switch from wood-burners in 1906, and in 1908 the innovation had reached Union Timber Co. at Grays Harbor.

Consuming about a barrel of fuel an hour, oil-burners had almost taken over by 1930, although a few wood-eaters were belching sparks around the landscape into the '40's.

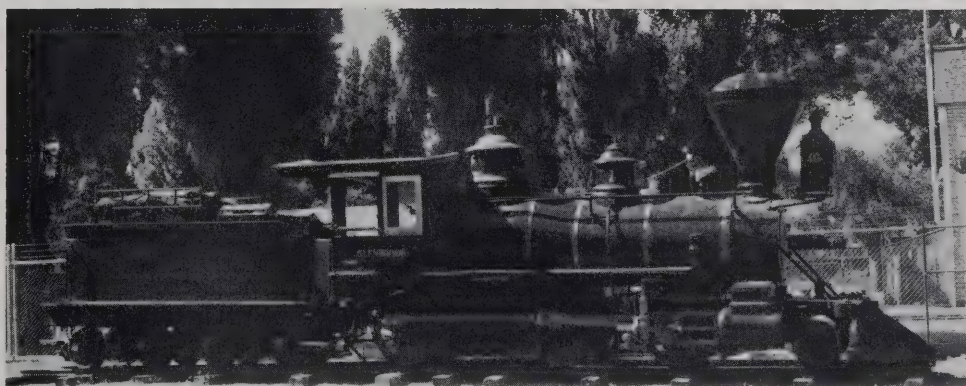
The Baldwin Locomotive Works observed its centennial in 1931 amidst general gloom in both the timber and locomotive industries. By then the Climaxes, Heislors and Shays were beginning to show that they were not geared for the new age of logging. Depression, Diesel and trucks took their toll. Railroad logging was changing, with tractors and trucks usurping many of the duties of spurline locomotives.

Such locomotives as the manufacturers were able to sell were rod types for main line log hauls. In 1934, the largest locomotive ever used in logging was delivered to Weyerhaeuser Company's Longview operation. It was a Baldwin 2-8-8-2 super-heated Mallet of 175 tons. Not a Shay, Climax or Heisler was built that year. Within a few years, even Weyerhaeuser's custom-built giant would become a rolling white elephant.



(California Historical Society)

BALDWIN mainline passenger type locomotives of the Seventies were frequently found on log-hauling roads. (Top) Standard-gauge giant which wound up on Mason County Central Railroad in 1886. (Center) Smaller version used by Russian River Land & Lumber Company's narrow gauge North Pacific Coast Railroad in 1875. (Bottom) Narrow-gauge miniature bought new by Carson-Tahoe Lumber & Fluming Co. in 1875 and transferred to Truckee Lumber Company's Lake Tahoe Railway & Transportation Co. in 1899. It is now on display at the Nevada State Museum.



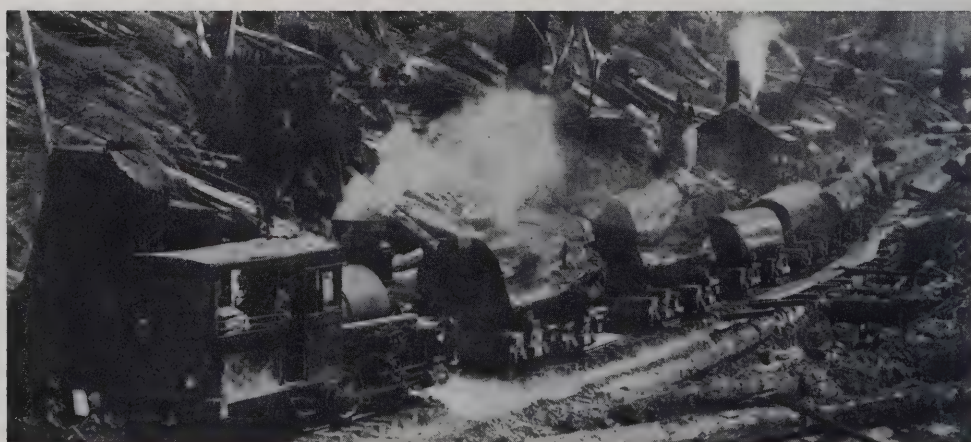


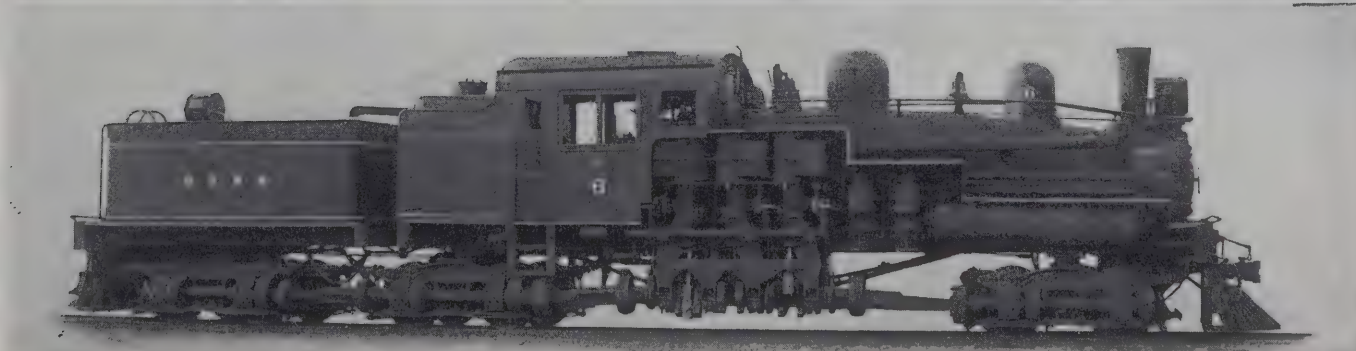
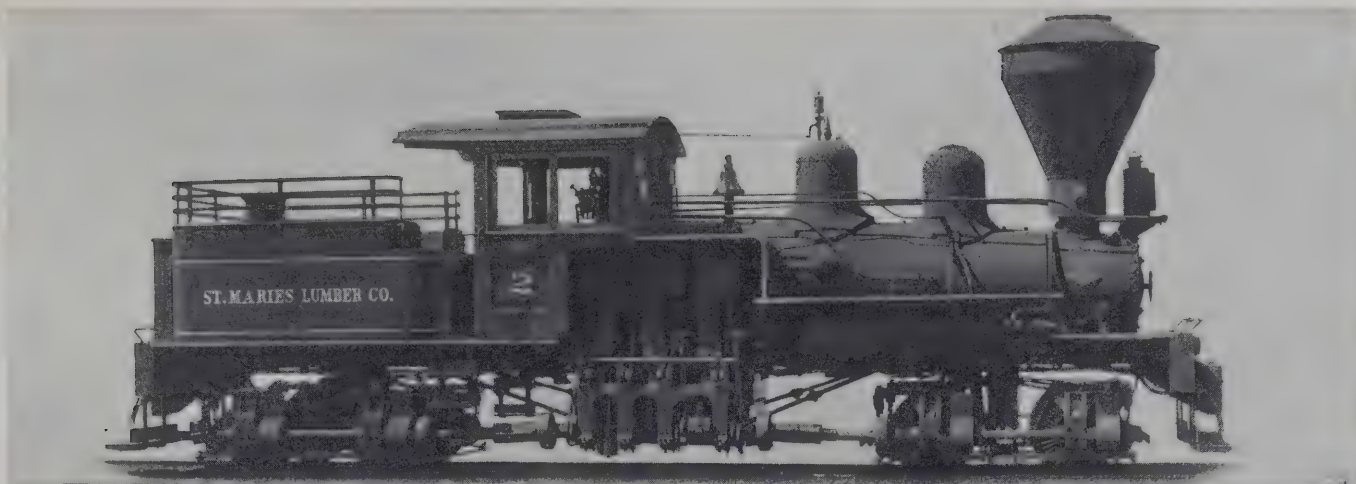
(California Redwood Association)



(Forest History Society)

THE GYPSY locomotive was a logical outgrowth of John Dolbeer's donkey engine. The portable log-handling engine was first placed on a locomotive in 1883, with one steam boiler serving both functions. (Top) Gypsy on Dolbeer & Carson Lumber Co. line in the 1880's. (Center) Number 2 locomotive of Oregon & Eureka Railroad at Vances in 1911. (Bottom) Luxury model with wooden cab used on a redwood fire salvage operation in the 1890's.





SHAY LOCOMOTIVES assumed many faces. This quartette of builder's photos shows models outshopped by Lima Locomotive Works within a few months of each other in 1920-21. Top to bottom: two-truck wood-burner of 32 tons; three-truck wood-burner of 67 tons; three-truck oil-burner of 83-tons; three-truck oil-burner of 100 tons.



SADDLE TANKS which carried water over the locomotive boiler not only dispensed with the water tender but provided welcome weight over the driving wheels.

(Top left) Earliest type of tanker was this Baldwin of mid-'70's vintage used on Mendocino Railroad.

(Top right) A decade later, Baldwin had added more power and removed some of the Victorian frills for the type used by California Lumber Co.

(Center left) By 1900, Baldwin's improved 2-6-2 for Whitman Logging Company's C. B. L. Railway assumed the classic tanker lines.

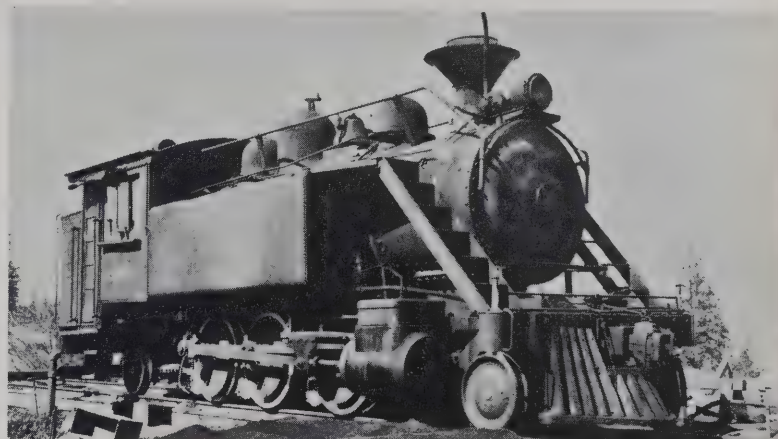
(Center right) Spunkiest rod locomotive of its size was the rating given this Porter 2-6-2 when it appeared in 1912.

(Bottom) Minarets type produced by American Locomotive Co. in the '20's became the most powerful single-expansion, two-cylinder, saddle-tank engine ever built. (Jack's Photo Shop)





REFUELING was often done in the woods from a tank car spotted on a convenient siding. Weyerhaeuser Timber Company's Mallet Number 110 carried oil in a cab tank and water in side tanks to add weight over the driving wheels. String of electric lights on the sides of this locomotive permitted the crew to "count the parts" during night operations.



SIDE-TANK logging locomotives were first built by Baldwin around the turn of the century.

(Top right) Craig Mountain Railway's One-Spot was built in 1910 with stairways over each tank.

(Right) Trim lines of Albion Lumber Company's Number 5 represented the peak of contemporary efficiency.

(Bottom) Ultimate in side-tank power was Weyerhaeuser's 132-ton Mallet 2-6-6-2 put to work in 1929 at the Longview branch



(Escola collection)





ARTICULATED locomotive with independnt truck suspension had obvious advantage on curves. Baldwin Mallet Number 201 crosses the Weyerhaeuser Timber Co. bridge near Kelso in 1952.



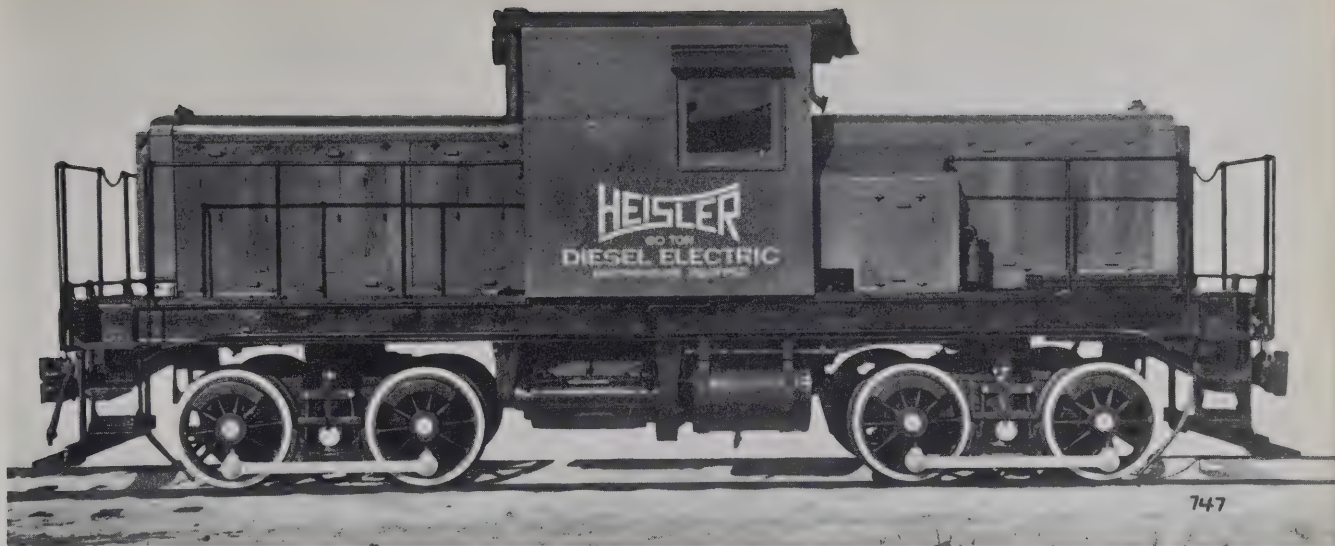
MALLET LOCOMOTIVE delivered to Booth-Kelly in 1910 was the first of its type to be equipped with side tanks. The 100-ton wood-burner proved an immediate success for main line log-hauling and the company later bought two more.



FIRELESS STEAM locomotive was billed by Porter as the answer to the forest fire problem in the '20's. Steam was obtained from a stationary source, such as a lumber mill boiler, and stored in the "rolling pressure cooker."

LOCOMOTIVE NUMBER 250 of Sumpter Valley Railway was one of the only two narrow-gauge Mallets ever used in the United States. Both were fixtures of the "Stump Dodger" line until sold in 1947 to International Railways of Central America.

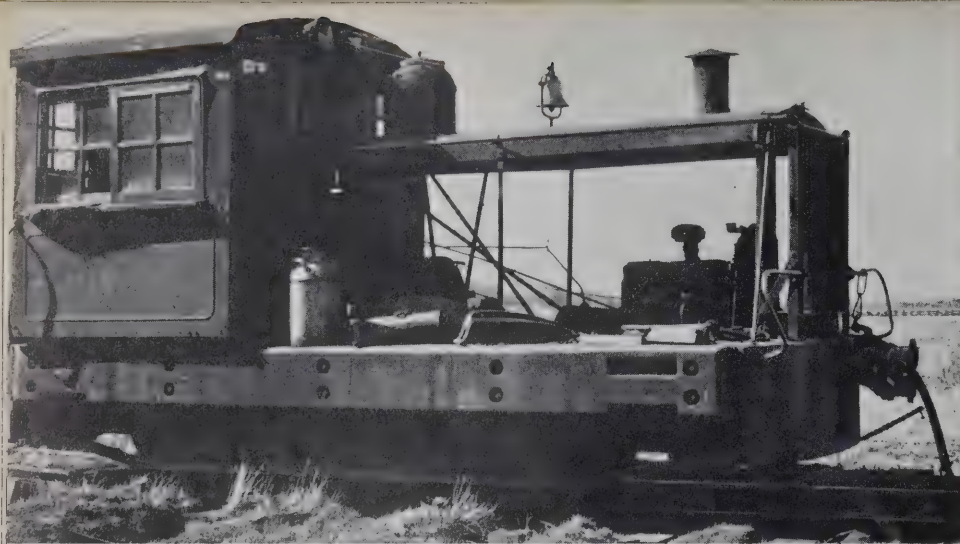




GEARED DIESEL locomotive was produced by Heislerville in the late '20's. The hybrid was supposed to combine the advantages of steam geared power with Diesel economy, but failed to make the grade with loggers. (Miller Freeman Publications)

ELECTRIC LINE of Red River Lumber Co. used Baldwin-Westinghouse freight motors with offset pantographs. Power was provided by hydro-electric facilities at nearby Lake Almanor.



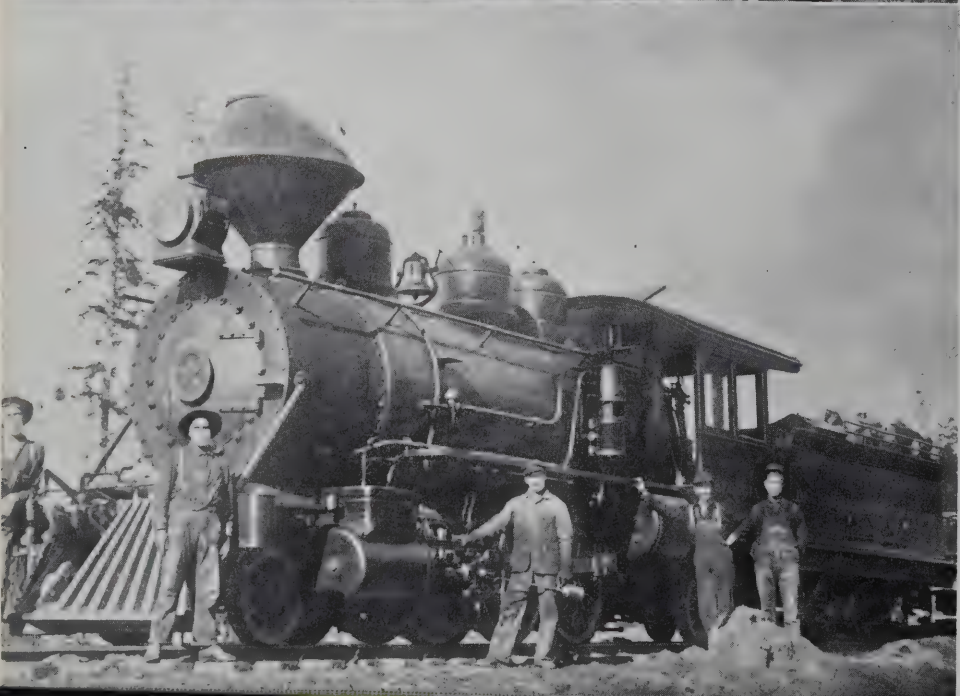


GASOLINE LOCOMOTIVES, such as this Plymouth, proved inefficient for most log-hauling duties. Placement of sand dome, bell and "smoke" stack is consciously reminiscent of a steam model.



GYPSY-RIGGED locomotives persisted into the 1940's. This wood-burning Heisler was used on the narrow-gauge line of Stoddard Lumber Co. in World War II.

(Library of Congress)



SEQUOIA TYPE locomotive was a modified Prairie 2-6-2 developed by Baldwin Locomotive Works for Western logging roads. This pilot model was displayed at the Panama Pacific Exposition in San Francisco and later made the rounds of logging camps as a demonstrator.

(Jack's Photo Shop)



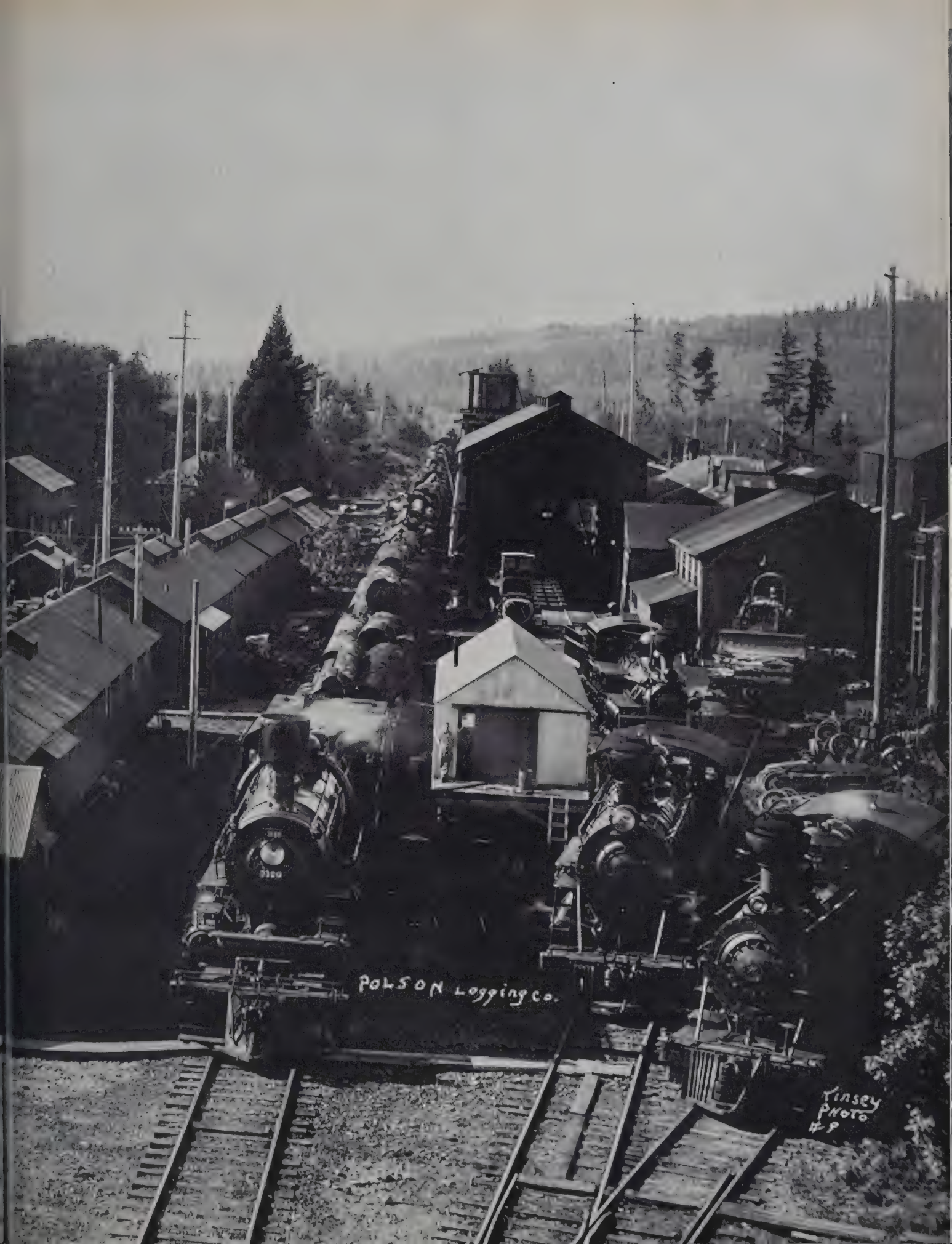
LARGEST LOCOMOTIVE ever built for logging service was Weyerhaeuser Timber Company's Number 200. It was a 2-8-8-2 superheated Mallet of 178 tons outshopped in 1929. With 75,000 pounds of tractive power, it could haul 100 loaded log cars up the 3.7 per cent grade of the Longview branch.

DIESEL locomotive of Red River Lumber Co. was the first to be used successfully for log-hauling. The 100-ton American-GE was placed in service in 1926. (Miller Freeman Publications)

(Next page) **LOCOMOTIVE ROSTER** of Polson Logging Co. in 1940 made an impressive line-up of power. Sharp eyes will be able to spot 14 locomotives in the Kinsey photo. Some of these engines are still being used for log-hauling by Polson's successor, Rayonier, Inc.







POLSON Logging Co.

Finsey
PHOTO
#8



TOWN ON WHEELS heads for a new show on the Cherry Valley Logging Co. line. Some of these camp car communities were moved into different counties, and one even changed states. (Darius Kinsey photo from Jesse Ebert)

LOGGERS' CAMPS on wheels first appeared around 1910. They kept the woods crews closer to their work and permitted the relocation of the camp as timber supplies were cut out.





BUNK CARS were not noted for luxurious appointments. There's reason to believe that the photographer had to clear away an extensive array of hanging sox and underwear before this picture could be taken. Brake wheel at end of car was a standard fixture.

"MUZZLE-LOADING" CAR with rear entrance was used by Snoqualmie Falls Lumber Co. as office and commissary in 1917. Other cars were used for sleeping, eating, cooking, recreation and equipment maintenance.





DINING CAR was usually the center of rail camp life. As in all camp cars, the floor boards were other than tongue and groove so that they could be easily replaced after scarring by loggers' caulked boots.



EMPTY BOTTLES and dude clothes attest that this northern California camp car scene was photographed on a Sunday morning. The rough life in early rail camps was brightened only by railroad trips to the nearest town.



COOKHOUSE SCENE at a Weyerhaeuser rail camp about 1920 shows, left to right, young bullcook or scullion, chief cook, two assistant cooks and female flunky.

PORTABLE TOWN out of Weyerhaeuser's Camp McDonald operation could be railed from place to place as new logging shows were established. Building in center foreground with skylights and end windows was headquarters for the saw filer. Mt. Rainier in background.



WOODS CREW was hauled between camp and the logging side by flatcar. This early model features the luxury of logs for seats.





VEHICLES for hauling woods crews assumed many forms, but were always referred to as "crummys."

(Top left) Train of converted hand cars at Weyerhaeuser Timber Company's Longview branch.

(Top right) Number 7 crummy of J. Neils Lumber Company's Montana operation was graceless but efficient.

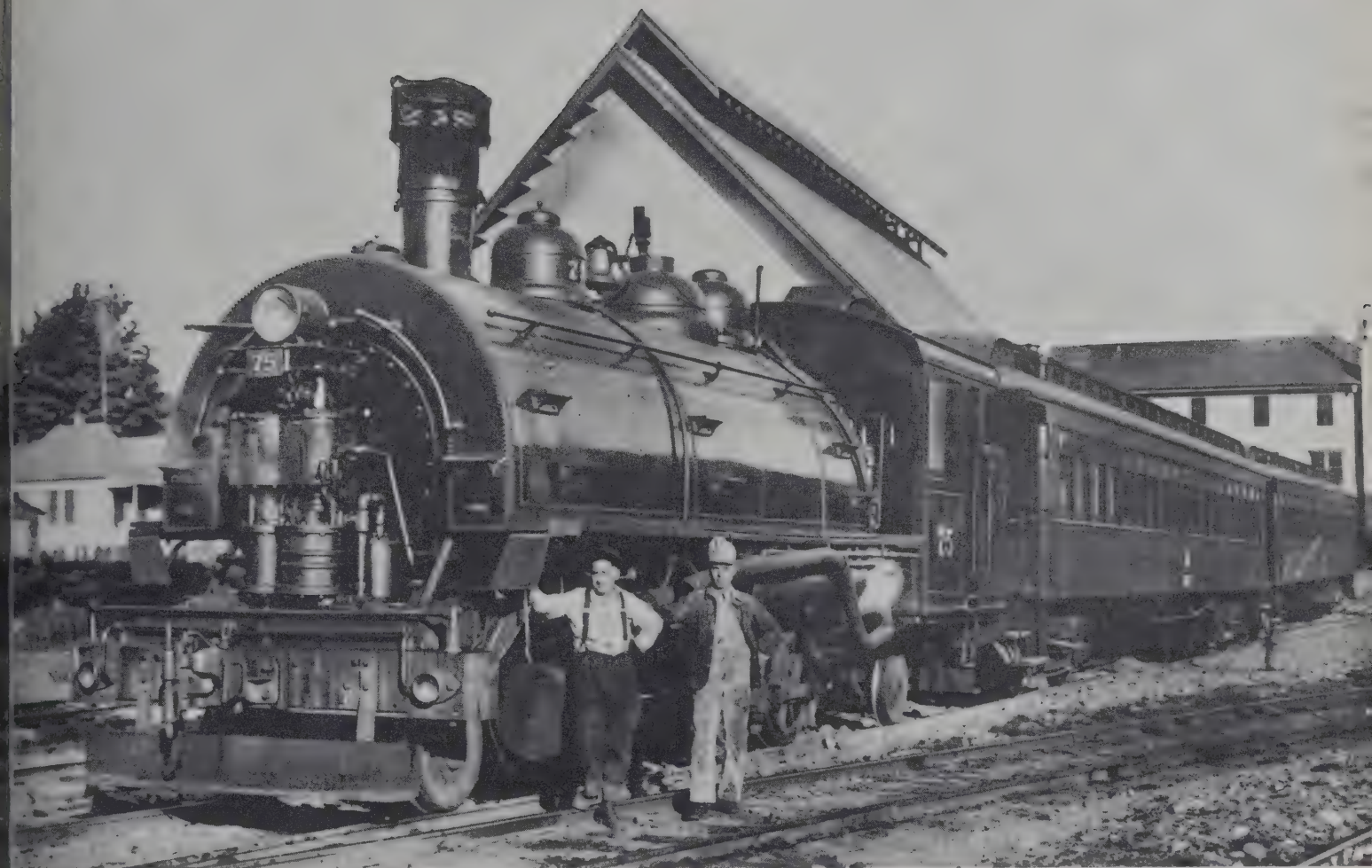
(Center left) Fallers load saws on gasoline-driven model at St. Paul & Tacoma Lumber Co. operation.

(Center right) "Fresh Air Taxi" was the name given to these Weyerhaeuser cars at St. Helens tree farm.

(Bottom left) McKeen car of electrified Red River Railroad had seen better days in California interurban service before hauling loggers.

(Bottom right) Gasoline passenger car of McCloud River Lumber Co. was of practical design and uncertain ancestry.

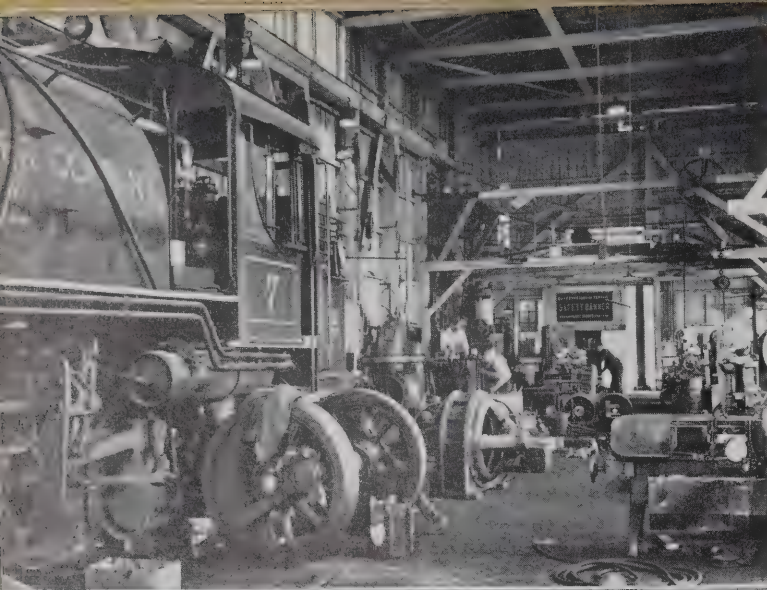




STEAM-HEATED CRUMMY was introduced by West Fork Timber Co. in the early '30's. Owner Tom Murray, left, rigged up a steam hose from the locomotive to the coaches and some times had difficulty in unloading the loggers on a cold day.

(Right) **FLATCARS** with roofs marked an early improvement in transportation for woods crews.



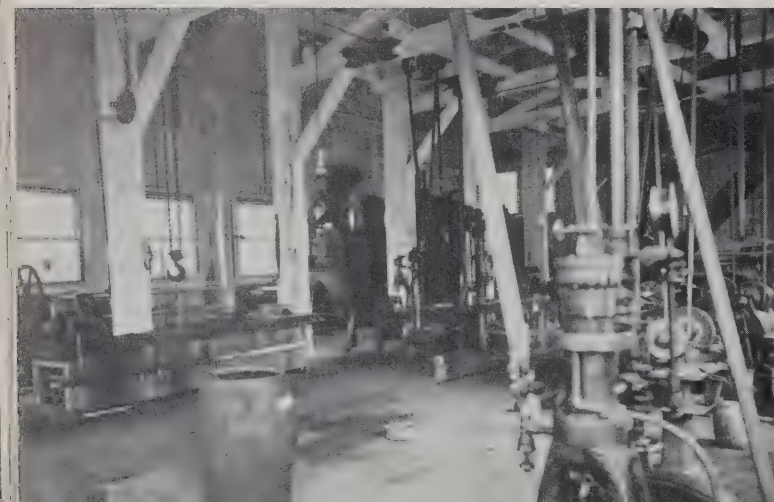


REPAIR AND MAINTENANCE facilities for locomotives and rolling stock were supported only by large or prosperous logging operators.

(Top) Shop of White River Lumber Co. was typical of medium-sized facility in World War I era.

(Center) Red River Lumber Company's elaborate layout in the '20's was the best in the industry.

(Bottom) Shay gets a going-over in a model machine shop of the last century.



SHOPS of Weyerhaeuser Timber Co. in the '30's were typical of large operations. (Top) Camp McDonald. (Lower) Headquarters camp near Longview.

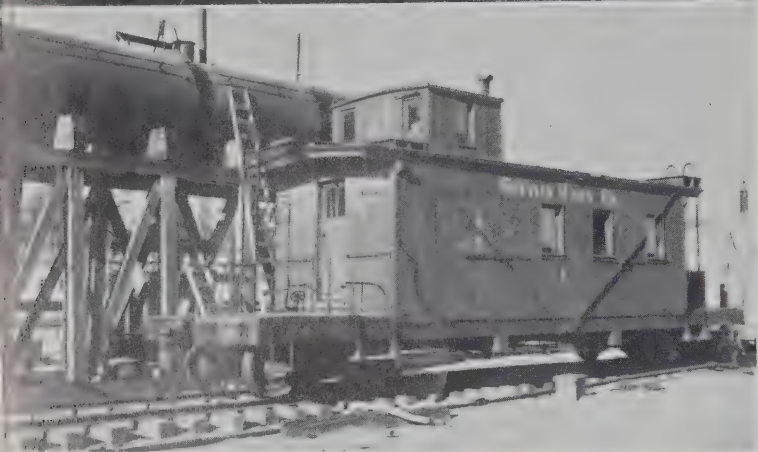
TURNTABLE was a luxury seldom found on logging railroads. The model below was owned by The Pacific Lumber Co. at Scotia. It supports their high-stepping Rogers 4-4-0 which was built in 1886.





DOGHOUSE on the tender was a necessity for large logging locomotives. It sheltered the conductor who kept an eye on things while the engine was traveling backwards. The con house as interpreted by (Upper left) Fruit Growers Supply Co., (Center right) Schafer Bros. Logging Co., (Bottom left) Weyerhaeuser Timber Co., and (Bottom right) Chehalis Western. (Top right) Rayonier, Inc. today employs the "rolling out-house" type inherited from predecessor Polson Logging Co. (Center left) Ultimate in comfort was offered conductors on the Shevlin-Hixon line with this converted Chevrolet coupe body.





CABOOSE on a logging line was known as the shack, cage, brain wagon or a dozen other names, and had as many uses. It was sometimes employed as a work car, fire car, ambulance, personnel carrier and mulligan car for food delivery. Home-made variations include Pickering Lumber Corp., California Western Railroad, Shevlin-Hixon Co. and Swayne Lumber Co. (Harold K. Vollrath photos)

MOTOR VEHICLES were easily converted for use on logging lines. (Bottom left) Superintendent's inspection car on Standard Lumber Co. line prior to World War I. (Bottom right) Dodge truck ambulance of the early '20's carried lucky number of "11," loggers claimed, because one would be lucky to come out of it alive.





WINTER BEAUTY goes unappreciated by the men who had to keep the logging lines open to the mill. Snow-clearing scenes above photographed at Red River Lumber Co. operations in the '30's.

SNOW PLOWS were needed to keep the logging lines open at higher elevations in the West. (Top) Basic pusher type with wing gear was used by Potlatch Lumber Co. in northern Idaho. (Center) Special wing-type plow of Weyerhaeuser's Klamath Falls branch scraped and packed the snow along the right of way. (Bottom) A pair of ancient locomotives converted to rotary snow plows for use in the Sierras.



SNOW JAM stalled the powerful plow of Red River Lumber Co. after a four-foot snowfall in March, 1938.



WATER TANK CARS were required to be on hand for fire-fighting duty as the result of state fire protection laws. Some logging operators carried a tank car with the locomotive during fire seasons.



PATROL CAR of White River Lumber Co. carried hose and tools.



STANDBY CARS of Long-Bell Lumber Co. at Longview.

FIRE CALL at Weyerhaeuser's Longview branch brought standby locomotive to the siding where the fire train was always in readiness. Headquarters personnel and crews from other parts of the woods have already been taken to the fire scene by speeder.

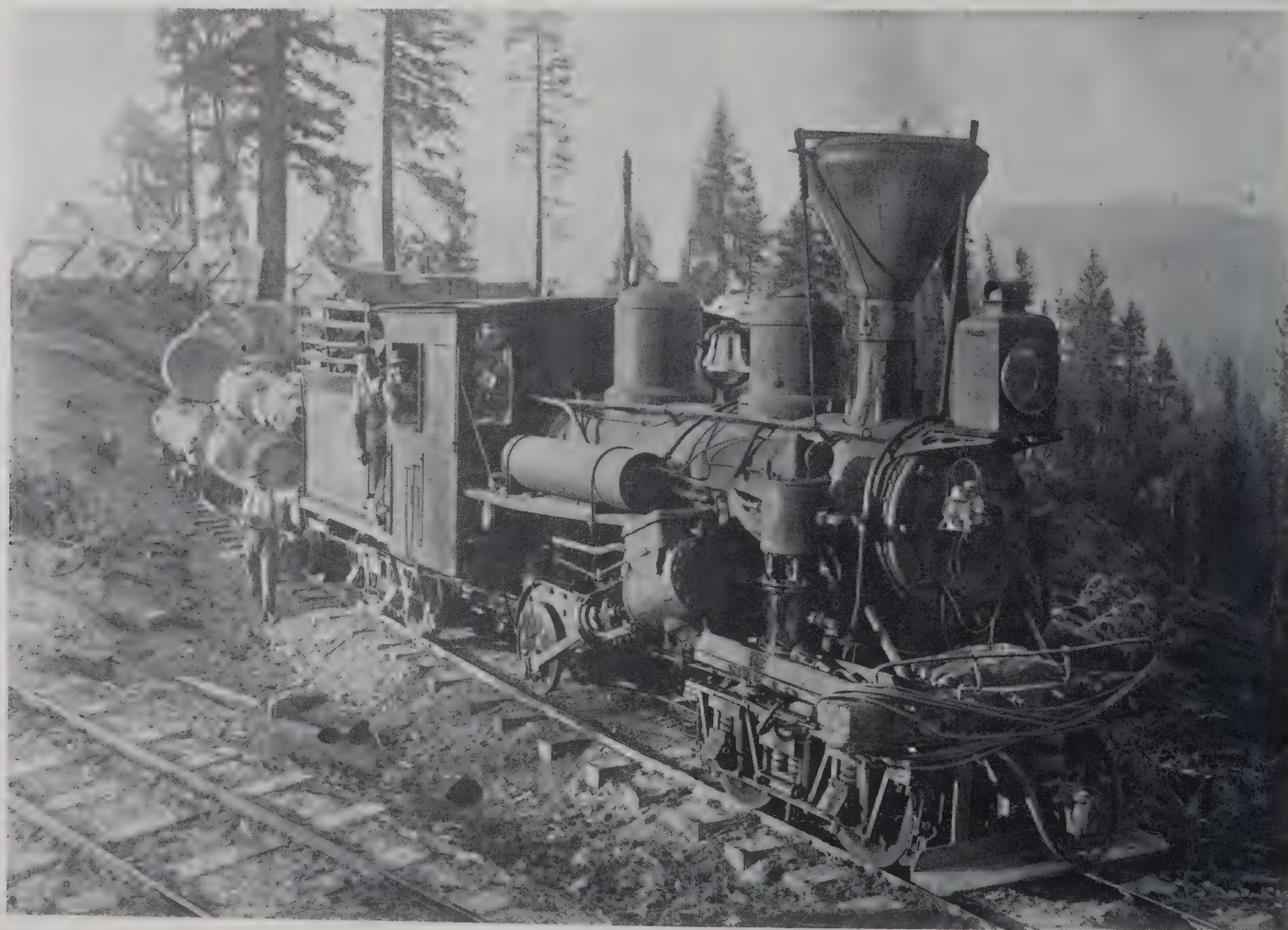
FIRE IN THE WOODS held a special terror for train crews, who realized that a burning trestle might separate them and their train from safety. (Below) Trestle on C. D. Danaher Pine Co. line is protected by a pump and hose provided by Shay Number 9. Mop-up work by crew of Mallet Number 106 at Weyerhaeuser's Vail operation





SPARK ARRESTERS were insurance against forest fires in the dry summers of the Sierras. Double-tubed spark catcher was used on "Betsy," Madera Flume & Trading Company's 10-ton geared locomotive, which was hauled up the mountains to start the first railroad logging show in the Sierras.

SINGLE-TUBED CATCHER was added to the clutter on Lamoine Lumber & Trading Company's narrow-gauge Climax in 1898.





GROTESQUE TUBE and ash can arrangement on Clio Lumber Company's narrow-gauge Shay was a noble effort, but was discarded because it impeded steaming efficiency.

TRESTLE of Clemons Logging Co. went up in flames during a 1918 forest fire. The entire operation was closed for three days while woods crews were put to work rebuilding the burned-out section.





METAL FLASHING was sometimes placed over trestle stringers as a fire prevention measure. The sparks which flew from locomotive brake shoes on a downgrade constituted a serious fire hazard.



JOINING THE BIRDS

That highball logging was the most dangerous major occupation in the West could not be denied. It was a fact of woods life accepted by the logging operator and his employees, and to a lesser extent by custodians of state industrial accident funds, who occasionally were forced to dip into the red in order to compensate injured loggers.

A primary contributing factor was the logging railroad. It was a constant hazard to trainmen, woods crews, casual passengers and unwary man or beast.

Perhaps as many as two or three thousand persons lost their lives in the assorted derailments, collisions, explosions and crack-ups that plagued the western logging pikes.

The woodsman's life was always in danger around the rails and he was sooner or later made aware of it. Whether trainman or logger, he had a subconscious set of reactions that came to his aid in emergencies. "Joining the birds" was the most frequently used of these measures, and his ability to jump safely off a troubled train was developed to a point of admirable effectiveness.

Staying alive around the logging railroad was looked upon as a sort of game in which many woodsmen won, but an appalling number lost.

Some of these mishaps brought high tragedy, as when the superintendent of Sierra Lumber Co. watched helplessly while his son died on the tracks, or when the wife of an engineer at McDonald & Vaughan's camp fell under the wheels of his train and was killed.

Other accidents could be spectacular, annoying or even funny.

Runaway trains were probably the greatest source of serious accidents. The cause may have been inexperience or poor judgment on the part of the engineer or his crew. It could have been rails made slick by ice, dew, rain or machinery grease. Maybe the sand pipes were clogged by mud or the brakeman had not done his job. The reasons for a large number of runaways will never be known because of the lack of survivors.

The other elements for disaster were always on hand: dangerous terrain, heavy log cargoes weighing in the hundreds of tons, questionable equipment and a disregard of safety considerations that sometimes amounted to bravado.

Many an engineer on the downgrade found that he had "lost his air," and without brakes, his safest course would be to jump, letting the uncontrolled train safely pass him by. This understandable desire to abandon the runaway and protect the lives of himself and the trainmen, however, put a severe strain on the rolling stock.

A train under such circumstances had several courses to follow. It could come to a more or less spectacular stop by the simple means of derailing itself. It could leave the tracks at high speed and plow into a bank or fly out into a canyon. On a few horrifying occasions, it might continue on down to the mill, creating a terminal jumble of logs, lumber, machinery and possibly bodies.

The logging railroad engineer was no coward. Indeed, one look at his facilities and equipment would usually be enough to convince the skeptic that the engineer was a man of courage.

Unless lives were in danger, the hogger didn't want to abandon his train, and some of the actions he took to prevent the final alternative are a credit to his breed.

When faced with the lost brakes situation, the customary procedure for the engineer was to slam the engine into reverse, "hang the throttle over the tank," and join the crew in hitting the brush. In a number of such cases, the trainmen sat down to wait for their runaway train to return. They had been through this routine before, knowing that the consist would meet a grade ahead which would slow it, stop it, and roll it back to the waiting crew.

Mile for mile, the logging roads probably presented the most dangerous railroading conditions of all time, providing many opportunities for heroism on the part of their trainmen.

An engineer on Polson Logging Company's Number 55 Shay was among the many hoppers

who earned the lifelong nickname of "Casey Jones." After signalling the fireman and brakeman off the train to safety, he rode out a runaway train in an attempt to stop it. A sharp curve helped his mission. As each of the cars rounded the turn, their momentum unloaded the logs. This lightened the train so that it could be brought to a stop. But Number 55 was never seen on the rails again. The strain of the runaway trip had torn the drive mechanism loose from the frame.

A runaway on Butte County Railroad in 1909 killed the engineer, fireman and brakeman, but a quick-thinking conductor prevented a greater loss of life. Realizing that the air brakes were gone, Conductor Johnson stepped between the bouncing cars and uncoupled the caboose. With the help of several logger passengers, he slowly hand-braked their car to a stop.

A clogged sandbox caused a runaway on the new line of Canyon Lumber Co. in 1905. The engineer whistled to the crew to join the birds and refused to leave his train until the others were safely off. No injuries were recorded in the pile-up that followed, but Canyon's brand new locomotive was an uninsured, \$10,000 loss.

The whistle warning became a sort of tradition on logging roads. Safety laws later made whistle signals mandatory for a distressed train, but the law was not necessary for the woods engineer. He knew most of his crew and logger passengers by their first names, and was not only responsible, but concerned for their safety.

This esprit de corps was shared by others who worked around the railroads. It was the shop crew of Puget Sound & Baker River Railway who became heroes in 1923, when screeching rails telegraphed trouble on the grade. Six loaded log cars had gotten away from the woods switching crew and were rolling down the main line. A few miles below, Locomotive Number 2 was steaming up the grade, its crew unaware of the danger.

With only the knowledge that the Two Spot was below and some kind of trouble was above, a half dozen shop workers jumped on a speeder and headed up the grade. The cause of the singing rails was soon evident, as the runaways, with smoking brakes, bore down on the men. Abandoning their speeder, the shop men grabbed brake sticks and assumed strung-out positions alongside the track. As the train went by, each man ran alongside a car and engaged his stick in the brake wheels. Slowly the runaway came to a stop.

"We never did tell the boys on the Two Spot what happened that day," recalls Shop Foreman Fred Nielson. "They usually had enough other things to worry about."

Among their worries was the aging piling on P.S. & B.R.'s wharf on Puget Sound. It finally collapsed one day, taking Locomotive Number 1 into the bay, along with its crew. Brakeman Albert Evans popped up to the surface and noted that the engineer was having trouble. He swam over to the floundering man and kept him from drowning until a boat came to the rescue.

Rotted timbers on Oregon, Pacific & Eastern's bridge at Walden plunged Locomotive Number 8 into Mosby Creek on a September day in 1924. As the caboose at the other end of the train snapped to a halt, Conductor Durham realized what had happened. He ran down to the ruptured bridge and worked his way through the water into the locomotive cab. Through bubbling water and escaping steam, he managed to turn off the fuel line which already was spreading oil dangerously. While he prevented a fire, it was too late for him to do much for the trapped engineer and brakeman. Both were scalded by steam and died in a hospital that evening.

It was a ghastly, but common enough fate for trainmen. Even a simple derailment could cause death or painful burns from escaping



SLIDES plagued the hastily built government spruce production roads in World War I. Rail-borne steam shovel was digging out slide Number One when it was engulfed by slide Number Two. Soldiers and civilian workers come to the rescue on the Clallam County Railroad in 1918. (Washington Historical Society)

steam. The locomotive whistle itself was responsible for fatally scalding three men in a wreck on the Monte Cristo line.

For a while, empty cars which ran away from the upgrade train were a dangerous nuisance on the C. D. Johnson Lumber Co. road. The train crew came up with a simple safety device. Before each run back to the woods with empties, the brakeman stuck an alder sapling in the drawhead of the last bunk car. Whenever a glance back at the train showed the tail-end marker missing, the brakeman knew that one or more cars of the consist was headed in the wrong direction.

The log train runaway could be a frightening spectacle. A 20-car juggernaut on the Twin Falls Logging Co. line in 1910 attained a speed of 80 miles an hour before winding up in a pile of splinters at Yacolt. The force of logs hurtling off runaway cars on the Canyon Lumber Co. line sheared off a pair of hemlock trees three feet in diameter.

Flying logs could clip off telephone poles, too, as Conductor Frank Grubb of Oregon & Eureka Railroad found out. He had left his string of loaded cars for a moment to phone the dispatcher. Inside the phone booth, he didn't notice when three cars quietly drifted off down the hill. Faster and faster went the runaways as Grubb, unaware, shot the breeze with the lonely dispatcher. The first message that the luckless conductor received from his runaways was when he suddenly found himself standing on his head. The cars had derailed down the line, scattering logs across the landscape. One of them had severed a phone pole without breaking the line, and the pressure on the wire had neatly flipped the telephone booth upside down along with its surprised occupant.

Because train orders were seldom issued on logging lines all that the engineer had to watch for, went the saying, was slides, washouts, deer, cattle, loggers, fallen trees and the boss' speeder—wherever that was.

Motorized hand cars appeared around 1900, and logging company officials of various stripe were quick to discover their advantages for quick trips to the woods. Along with crew cars, ambulances, work cars and other unscheduled vehicles that might be on the track, the speeders added considerably to the hazards of rail travel. Superintendents by the dozen were killed or injured over the years when their unannounced trips resulted in collisions with trains.

Such a crackup on Simpson Logging Company's line brought one of the earliest overtures



WASHOUT in the Santa Cruz Mountains at the turn of the century sent "Betsy Jane" wallowing down the creek. California-made saddle-tanker was used successively on Santa Cruz & Watsonville Railroad, Loma Prieta Railroad, Pajaro & Santa Cruz Railroad and SP's Loma Prieta branch. (SP photo from Amaragosa Memorial Library)

to the cause of safety. Victims of the collision were the manager and railroad superintendent of the company, who immediately ordered all rolling stock, including locomotives, to be painted an unartistic, but highly visible shade of orange. Section Boss Ed Dooley received the word, along with several gallons of paint, on March 17.

"The Chief may be a foine man," Dooley spouted, "but oi can't do this terrible thing of a St. Patrick's Day." With commendable under-

standing, the management allowed the Irishman a one-day delay in applying the orange paint.

Bill Deary was another stubborn Gael who became a legend in the industry. As manager of Potlatch Lumber Co., Big Bill also had charge of Washington, Idaho & Montana Railroad. His speeder, equipped with a buggy seat, was frequently encountered out on the line. Locomotive engineers learned that on such occasions they were expected to stop their trains, back up, and let Deary's chariot pass at the nearest siding. The procedure applied even to the regular passenger runs.

The inevitable happened one day when a downgrade log train refused to yield the right of way to Deary, tossing him and his speeder into the brush. The fact that the boss was uninjured and his hated speeder a total wreck brought joy to the woods. Perhaps the Old Man had learned his lesson the easy way and the trains could begin to run on schedule.

But the hope was short-lived. A few weeks after the wreck, the boss returned to the rails on the most elegant speeder of all time. It had not only a buggy seat, but was graced with a tasseled canopy and an elaborate paint job. As long as he was alive, Deary's rail-borne surrey with the fringe on top continued to demand and receive the right of way.

Pat Lyons, logging super of Swayne Lumber Co., used a converted touring car speeder which he described as a "dehorned Ford fitted with permanent flat tires."

One day in 1919, Lyons picked up a visiting salesman who welcomed the opportunity to ride back to camp in the flange-wheeled Model T. As the car picked up speed on the down grade, the salesman repeatedly attempted to slam his door shut.

"Oh, that door won't close," Lyons said. "It took off the catch."

"Why?" asked the apprehensive passenger.

"Because this car jumps the tracks so often," Lyons replied, "and I want the door to be open so I can crawl out from under."

Those who worked on and around the railroads became adept at righting derailed rolling stock. The ability was particularly evident when the accident occurred on the daily trip back to camp or on the Saturday train to town. Accidents on company time seemed to be more time-consuming.

So many derailments occurred on the average logging line that the rerailing process became almost routine. Most spur line locomotives carried as standard equipment several heavy chunks of steel called humpbacks or car frogs. Following a simple derailment, the train crew would dismount, pick up the car frogs and spike them to the ties ahead of the misplaced wheels. When the car was pulled by the locomotive, its wheels were forced to climb the frogs back onto the track.

Deraillments which couldn't be handled by frogs or hand-operated jacks sometimes called for the building of a temporary parallel track, upon which the errant rolling stock was steamed or hauled back to the original rails. The proximity of a woods donkey engine was a great help in more serious accidents and in later years the crane-like boom of the cherry picker could be called upon. On some occasions, the logging operator was obliged to borrow heavy equipment from the nearest mainline railroad company.

Train crews became "catty" about questionable sections of track and developed a number of expedients to avoid them. One of these was the car line. By means of a long cable attached to the pilot, the locomotive was able to pull cars across doubtful track without endangering itself.

The reverse was a trailer, a flat car pushed ahead of a locomotive to couple onto cars located across track which might be unsafe for the heavy locomotive. Sometimes cars were "jill-poked" or poled by hand in and out of sidings.

An unusual method of combatting slippery rails was developed by Anaconda Copper Mining Company's lumber division. When ice or snow made the track dangerous, men were stationed at intervals along the grades to spread hot sand on the rails.

In the fading days of the Chehalis, Cowlitz &



BOILER EXPLOSION on May Creek Logging Company's new Climax took the life of engineer and fireman near Kenneydale, Wash., in 1911.
(Don Clark collection)



Cascade line, crews refused to take trains across a shaky trestle over the Cowlitz River without a locomotive at either end. The head-end power was abandoned at one end of the trestle and pushed across by the trailing engine. When the first locomotive and cars were safely across, the crew would leave the rear engine, walk across the trestle, remount the leading locomotive and resume their run.

No matter how skillful the woodsman became in avoiding trouble, the dangers of railroad logging were always waiting. For an official of Clover Valley Lumber Co., the end came when he absent-mindedly crossed the tracks in front of a train while reading a newspaper.

Or, the railroad could be what the lawyers might call "an attractive nuisance," as in the case of a well-known Pacific Northwest logging operator. This logger's reputation was based more on his legendary drunken binges than anything else. On one alcoholic occasion, he ordered his engineer off the train and took the locomotive on a frightening race down the main line. Fortunately, only one life was lost in the resultant wreck—that of the owner.

Accidents in the woods could prove to be a cruel thing to injured men. Doctors, hospitals and sometimes even first aid was available only at the other end of the track. If a log train was already on the line, it was impossible to give clearance to a special speeder or an ambulance car. Or the accident itself might have blocked the track or otherwise put the railroad out of commission. The track was literally a lifeline and it failed with tragic regularity.

No doubt there would have been many more accidents had not the average speed of a loaded log train been eight and-a-half miles an hour.

Engineers who survived an accident were subjected to the logger's biting humor. A hogger

on the Dempsey Lumber Co. line carried with him the lifetime stigma of being called the king of the milk run for a collision with a speeder which was bringing a load of milk to the camp.

A less flattering nickname was applied to the engineer of a Warren Spruce Co. train which piled several empty cars into the camp latrine pit. The unhappy loggers who had to dig out the cars were the first to apply the unprintable name, which followed the engineer from camp to camp.

Equally unpopular was the engineer at Conlough Company's camp, who let daylight into the cookhouse with his Shay. As it was just before mealtime, the loggers never allowed the engineer to forget his untimely deed.

Perhaps the most unpopular woods hogger of all time was the engineer of a runaway Sumpster Valley train which deposited its cargo of beer kegs across the Oregon countryside instead of at the logging camp.

Slides and washouts were a common cause of accidents on the hastily-built logging lines. Union Lumber Company's California Western Railroad was especially hard-hit after the earthquake of 1906. Winter storms that year caused scores of slides and took out eight bridges. It was three months before a train could be moved over the line.

Storms once pushed a church onto the tracks of Ostrander Railway & Timber Co. The editor of *West Coast Lumberman* pointed out that Ostrander President E. S. Collins was an active church worker, "and his friends have been unkind enough to say that it looked like a visitation of Providence."

Among the notable washouts were Everett & Monte Cristo Railroad's loss of every bridge in 1892 and the collapse of 1400 feet of trestle on Oregon Lumber Company's line near Dee in

1921. For spectacle, however, nothing equalled the disintegration of Seattle, Lakeshore & Eastern Railroad's bridge over the Snohomish in 1888. News of the losing battle between men and the raging river brought spectators from miles around. For two days, they watched in fascination as pile driver crews and boom men attempted to save the bridge pilings. They continued to watch in horror as the bridge slowly gave way, and swirled off downstream with men and equipment. Miraculously, no lives were lost. Pieces of the bridge were recovered miles downstream and shipped on flat cars back to the original site. Within two months, the bridge was again carrying log cars.

The hazards by which Nature vexed the log train seemed endless. A tree might fall across a flatcar carrying the woods crew, as it did on the Seattle Logging Co. line. Or one might fall on the locomotive, as happened on Peninsular Railroad and on Cherry Valley Logging Company's line.

The engineer and fireman of a West Oregon Lumber Co. train were killed in 1912 when their locomotive was struck by lightning. A feisty bull elk took exception to the whistle of an Idaho log train one day in rutting season, and charged the locomotive with suicidal results.

It was bears which stopped all operations for two days at Linberg Bros. camp in 1928. Not even the hardest logger would go into the woods as long as a threatening mother bear and her two cubs were wandering around. Attempts to drive the bears away were unsuccessful and even the Kitsap County game warden gave up. The impatient woods super finally rounded up a dozen volunteer loggers, armed them with

HEISLER NUMBER 5 of Buffelen Lumber Co. met slick rails coming off the hill at Eagle Gorge one morning in 1926 and plunged into a canyon. Crew of the runaway train jumped and there were no injuries.



rifles and pistols, and sent them back to work in the woods.

Of all the dangerous surprises which faced the engineer, the most common turned out to be stray livestock on the track. Many timber companies, particularly in the pine region, leased their land to graziers. In some cases, the grazing income never matched the payments made to aggrieved cowboys and sheepherders, who turned up with as many dead animals as they thought the railroad management could afford to indemnify.

It seemed that only the most valuable livestock succumbed to the passing log trains. The agent of Puget Sound & Grays Harbor Railroad in 1886 reported to his boss that he had no choice but to pay Farmer Duckworth \$75 in damages for a sickly old cow that hadn't the energy to move off the tracks. The farmer admitted having paid considerably less for the beast, but explained in a story that was to gain familiarity, that it was a good milker and heavy with calf at the time.

A state law came to the aid of Colorado railroads in 1885. It called for standardized payments to owners of animals killed on the tracks. Texas cattle brought from \$12 to \$25 each; calves, \$10; American sheep, \$2.50; and Mexican sheep, \$1.50.

The Washington territorial law dealing with the matter called for prevention rather than cure. According to the early lawmakers, "a dog is necessary to put to flight cattle obstructing the track. A dog shall be carried on the cow-catcher of all trains." The edict was never repealed.

The all-time record for bagging domestic stock in one day belongs to Number 4 locomotive of Arcata & Mad River Railroad. Working out of Glendale, it ran over two large beef steers and four geese without damage to the locomotive.

The encounter between log train and cow, horse, sheep, goat or pig was frequently fatal to the straying animal, while just a nuisance to the crew. It could be the other way around, however, as demonstrated by a bloody accident on Lake Valley Railroad in 1891. Running the downgrade from Myers to the Lake Tahoe log dump, the last train of the day was carrying five loaded log cars and a crew of Chinese cordwood choppers. A stray yearling on the track brought the train to such a jarring halt that the forward trucks were jammed into the firebox. Amidst flying logs, four Orientals were killed and

many injured. The engineer was permanently crippled. Bodies of the Chinese woodsmen were taken to San Francisco and placed on a steamer for the last leg of the voyage to their ancestral homeland.

Sooner or later, even the least intelligent domestic animals learned that the bells, whistles and frightening noises of the highball train brought danger, and kept away from the rails. How often impatient engineers hastened the conditioning process with a blast of steam, a handy B-B gun or a nudge of the pilot will never be known.

To the assorted acts of God which confronted the railroad operators must be added an appalling record of man-made mishaps. All the frailties of the human soul were accounted for in the causes of grief which befell log trains over the years.

In 1895, Superintendent Sol Simpson of the Blakely road was obliged to issue warrants for the arrest of a group of religious zealots who had derailed a locomotive and were continuing to place obstructions on the rails. As members of the "New and Lateral House of Israel" sect, they felt compelled to hinder the Devil's mission, as symbolized by the clanking locomotive. The four men and boys who were apprehended received the benefits of a more normal Christian outlook by being permitted to leave town without punishment.

A series of mysterious bullet holes that they discovered in their locomotive at unpredictable intervals caused no little concern to the trainmen of a logging road near Sultan in 1901. The shots that caused them were never heard by the crew above the noise of the train. Sleuthing by local authorities eventually turned up the culprits. Instead of the madman or juvenile delin-

quent that was expected, the woods dragnet brought in some Chinook Indians. In a defiant assertion of their old beliefs, the redmen were trying to avenge the death of a comrade who had been run over by a log train.

The bitterness of the war between timber operators and the International Workers of the World, the "Wobblies," sometimes found an outlet on the logging lines. Every type of sabotage was inflicted on the rails and rolling stock during the World War I years and shortly after. Agents of the union loosened rails, greased the downgrades and placed dynamite on the tracks. Those trainmen and loggers who were resultantly killed or injured were just "scabs" anyway, went the reasoning.

The railroad played a part in retribution at the Big Creek Logging Co. camp. Manager David E. Stewart caught up with a pair of troublemakers in 1918 and with the help of 50 loyal loggers, took them out to a woods spur. Using hot gear dope from a locomotive, the would-be saboteurs were "tarred" and feathered. The Wobblies were then ridden along the tracks on cedar rails and turned loose in the woods. Stewart's camps became remarkably free of I. W. W. agitators.

In the 1940's and '50's, timber company trains often carried hunters into the woods in the seasonal search for deer, elk, bear and birds. The sportsmen would be dropped off at marked points along the right of way in the morning and picked up at the same point in the evening. One such "hunters' special," operated by Long-Bell Lumber Co. in 1952, carried a few riflemen who had been preparing for the day-long hunt by the use of liquid fortifiers. The engineer of the train was about to slow down for the next stop when a bullet zipped by his ear and rico-

DERAILMENTS came with monotonous frequency on temporary spur lines. They seldom caused serious damage because of the slow pace of logging locomotives.





TRAIN DISPATCHER and his control board were necessary to efficient operation of larger logging roads. But most lines with more than one train in the field relied on "smoke signals" from the wandering locomotives to set schedules and prevent collisions.

cheted around the cab. One of the eager passengers thought he had seen a buck, and failing to attract the engineer's attention by shouts, had delivered his request to halt the train by a more compelling means. The incident brought an end to all free rides for hunters.

Impatience in one form or another may have killed as many woodsmen on the logging roads as did carelessness.

Fridays and Saturdays, when in later years the men were allowed to ride the train into town for the weekend, brought a disproportionate number of accidents. Having just been paid, the loggers riding the "Millionaire's Special" were always in a hurry to reach the attractions of the city skid road. In an incident on North Bend Logging Company's line in 1920, six of them paid with their lives after persuading the engineer to take the downgrade without waiting for a counterweight.

Other would-be celebrants never reached the city lights, for the flat cars they commandeered for a quick trip down the grade met with disaster. Even idle locomotives were taken over by the impatient loggers who wanted to rid themselves of "camp fever."

Everyone in the woods envied the hogger. Just as many generations of youngsters around the world wanted to grow up to be an engineer, so did buckers, fallers, cat-skinners, whistle-punks, choker-setters and even the boss feel the yen to command the power of the locomotive.

The dreamed-of opportunity came to a member of the rigging crew at Schafer Brothers camp in 1913. The Schafers had just taken de-

ilvery of a brand new Heisler, but had no engineer to run it. In desperation, they gave the coveted assignment to a fast-talking woodsman, who assured them that he was competent, although admitting that he hadn't yet earned his engineer's ticket.

On his first run, the eager neophyte lost control of the loaded train on a six per cent grade. Just before the runaway crashed, the substitute engineer managed to follow his crew in jumping off the train. Wisely, he continued on into the woods.

The recently shiny Heisler was eventually recovered and sent to Tacoma for repairs which cost \$4,000. The incident came close to putting the Schafers out of business.

Misfortune of a personal nature later caught up with Peter Schafer when a Schafer locomotive rammed his automobile at a crossing. From a hospital bed, Peter claimed that the accident was a one-in-a-million freak—the train had been on time.

His brother, Albert, one day recognized a man he hadn't seen for some time. It was the missing "engineer" who had piled up the new Heisler.

"Where have you been all these months?" asked Schafer.

RADIO COMMUNICATION was a post-World War II innovation which kept the locomotive engineer in touch with the dispatcher, the woods crew and the conductor in the caboose.



"I been running," the ex-engineer replied.

The repentant woodsman was put back on the payroll, but in a capacity far removed from the railroad.

Errors in judgment by the men who ran the trains were common on the woods lines, where the disciplines and regulations of the mainline companies were impractical and unenforceable. The hogger was usually the highest paid man in the woods, aside from supervisory people, and had responsibilities to match. Due to the nature of his work, the engineer, along with the train crew, had an independence that was often envied by other woodsmen. And there was sometimes a bottle stashed away in the cab in violation of Rule G or its woodland equivalent. Considering the shabby equipment and hazardous working conditions that he often had to put up with, there was no man in the woods more deserving of an occasional sip of bottled "boiler water" than the train man.

The engineer of Royce Lumber Company's lone locomotive had a happy combination of jobs. He was regularly employed as the bartender of Eatonville's leading saloon, and parked

his idle engine on the tracks which ran through the center of town in front of the establishment. When a whistle signal from the mill indicated that a load was ready, the bartender's apron was exchanged for an engineer's cap and the saloonkeeper was soon putting on a head of steam instead of a head of foam.

Perhaps it was the traditional cheer of the New Year's season that brought the locomotive "Polly Ann" to one of the most memorable end-



DISASTER came to Number 4 locomotive of Oregon & South Eastern Railroad in 1926 — just as planned. The vintage Baldwin was playing the title role in "The General," a silent movie starring Buster Keaton. Wreck scene took place on a temporary trestle over the Row River, following re-creation of the famous Civil War locomotive chase between "The General" and "Texas." (Below) Number 4 about 15 years before its dramatic end. (Charles Nelson collection)





CHERRY-PICKER, a multi-purpose boom rig, was the pride of C. D. Danaher Pine Co. when first placed in service in 1915. But there were some things it couldn't do, as the inexperienced operator soon found out.



ings of all man-caused accidents. A partner of Guerne & Murphy Lumber Co. decided that blowing up their 2-2-0 would be an appropriate way of welcoming the new year of 1889. Dynamite sticks were placed in the aging locomotive, and as bells, horns and song marked the arrival of midnight, "Polly Ann" took to the air with a blast that sobered the most cheerful merry-maker. Too much dynamite had been used for the event and the lumber company was obliged to replace every window in the town of Guerneville.

High-spirited woodsmen found that horseplay provided a certain amount of release from the rigors of camp life. The engineer of the crummy car was a common target, and he developed skill in avoiding hotfoots, tossed objects and burning gloves. One of the fastest log runs in history was set on the Hobbs, Wall & Co. railroad when a prankster threw a hornet's nest into the locomotive cab of a mill-bound train.

The loggers' humor also showed up in the stories they told about their grim, chancy game with the railroads. A favorite of the bunkhouse was the yarn about Ol' Doc the hogger, who rode out a locomotive which took a flyer off the trestle over Fourth of July canyon. Over and over the locomotive rolled through the timber, carrying the trapped engineer and fireman to inevitable doom. When rescuers reached the smoking locomotive at the bottom of the canyon, they were amazed to see the two men emerge unhurt and smiling.

"A candy run, Boys," the engineer explained. "When she started to roll, I tried to figger out how many times she'd turn over and which way she'd land. I had to throttle her a couple of times to keep her on course, but she landed on her wheels just like I figured, though a big cedar damned near ruined my calculations."

The number of railroad accidents increased as the highball days of logging picked up steam.

Brakemen on logging lines had an accident frequency higher than that of the high climbers, or tree toppers, the latter occupation having been classified by the National Safety Council as one of the five most dangerous in the country. A shortage of fingers became the badge of the brakeman's work as much as it was the sawyer's down at the lumber mill. The cause was not whirring blades but the link and pin coupling.

By 1882, more than 3100 patents had been issued for car-joining devices designed to re-

place the primitive pin type. But it took another five years before the Class I railroads universally adopted an automatic coupler known as the "M.C.B." (after the Master Car Builders).

Everett & Monte Cristo Railroad in 1895 became the first on the Pacific Coast to use automatic couplers on all its rolling stock. E. & M.C. was at that time backed by Rockefeller interests, and could well afford the expensive gesture.

Safety laws notwithstanding, some logging roads used the finger-smashing link and pin method of joining cars into the era of World War II and beyond.

Air brakes were being used by 229 logging companies in 1917, but some lines never bothered to convert from manual braking. One large outfit in Washington kept hand brakes until its line was abandoned in 1958.

In 1905, 22 trainmen were killed and 243 injured on common carrier lines in the State of Washington alone. Most of the fatalities were on log-hauling runs. Logging railroads were considered so dangerous in Oregon in 1915 that the state workmen's compensation act was amended to increase the employer's contribution from three per cent to five per cent of the trainman's wages.

The high costs of carelessness were made evident in other ways. The Washington supreme court awarded a young man \$25,000 for the loss of both legs in a 1913 rail accident. As early as 1899, the heirs a man killed by a Benson Logging & Lumber Co. train received an out-of-court settlement in their \$20,000 suit.

Safety was a long time in arriving in the woods. In 1917, the California Industrial Accident Commission issued a sweeping new set of regulations for the operation of logging roads. Other states followed with similar rulings. Among other requirements, the new laws called for air brakes, guards on the bevel gears of Shay locomotives, fire-prevention devices and two-man minimum crews.

For the most part, the noble regulations for safety were considered flexible, and little effort was expended in enforcement by either railroad operators or the state agencies. The influence of the railroad brotherhoods was lacking also, as trainmen on logging lines were usually ineligible for membership in the rail unions.

As late as 1952, the California Safety Commission ordered Diamond & Caldor Railway to replace its link and pin couplings with an automatic type. The edict was too much for the little line. Its owners decided to abandon it

instead, and D.&C. went into history as the last common carrier to employ link and pins and one of the few to be killed off by a safety regulation.

Gestures to remind employees that they were engaged in a dangerous occupation were made by some companies. Morrison Mill Co. gave all its employees a life insurance policy for Christmas in 1919. Group life insurance was inaugurated by Brix Bros. Logging Co. in 1922.

Sugar Pine Lumber Co. painted safety slogans on rocks along its railroad right of way which warned "Look Out For Sweepers," "Legs In" and "No Smoking."

Middle Park Lumber Co. placed a white paint mark on the rim of each car wheel so that the train crew could spot a locked wheel when the train rounded a curve.

Starting in the '20's, safety engineers became as important as locomotive and logging engineers on the railroads of large companies.

In later years, operators looked upon their employees more as human beings than as adjuncts to their woods machinery. The attitude found expression in the safety measures that were enforced as much for the welfare of the men as for their employers.

More than anything else, it was the enormous cost of haphazard operations which hastened the adoption of a safety philosophy in the woods. In addition to cash payments to injured woodsmen or the heirs of those less fortunate, there were the expenses of repairing and replacing wrecked equipment, the high price of insurance and the costly down time in woods, mill and on the railroad.

As time passed, the operator realized that he couldn't afford to run a haywire show, and economics once again stepped in to influence the destiny of the logging railroad.



A **TRIO** of wrecked Shays demonstrates that trestles and high water made a dangerous combination. Each of these locomotives was repaired and returned to log-hauling service.



THE SLOW BELL

The editor of *The Timberman* paused to wipe his glasses and stared thoughtfully out the window to the rainy Portland streets below. It was autumn, 1929, and he had just finished compiling statistics for the 1930 edition of *The Directory of the Western Lumber Industry*. While lumber production was off a little from the boom days of the earlier '20's, the editor found optimism in the fact that logging railroad mileage had reached an all-time high.

On the eve of the Great Depression, a thousand steam locomotives were hauling logs on the 7,000 miles of tracks which snaked into the western woods. Three hundred companies operated their own logging railroads. Trackage was increasing at the rate of five per cent a year.

The editor could report to the trade that the typical line had grown to 25 miles in length, with a high average of 45 miles in the sparse forests of Colorado and a low of 18 miles in Oregon and Montana. Some rail hauls approached 150 miles. The 1930 *Directory* would show an average of three locomotives per company, of which two were geared.

The Shays, Climaxes and Heislars were then busy in spur logging. They climbed out on the ridges to pick up cars which had been loaded on the spot with logs yarded not more than a couple of thousand feet away. At the bottom of the spur grade, the cars were switched to the rod locomotive for the main line haul to the mill.

More than half the nation's supply of old-growth timber stood green on the western landscape and *The Timberman* editor shared the hope of his readers that the pattern of highball logging would continue forever.

As *The Timberman* correspondents made the rounds of the camps in 1929, they found an optimism equaling that of the populace in general. Hoover was president. The national purpose seemed to be symbolized by the stock market, bathtub gin and flag-pole sitters.

Thomas B. Walker, president of Red River Lumber Co., was the fifth wealthiest man in the country, and other millionaires were not hard to find in a business which had not stopped

growing for a century. A. H. Fleming of Sugar Pine Lumber Co. donated five million dollars to the California Institute of Technology.

The timber industry had recently climbed to the second largest in the country and the Schafer brothers reflected the western logger's rosy outlook by erecting a neon sign 160 feet long that would be visible to airmen 75 miles away. Lamm Lumber Co. was preparing to send out its traditional Christmas gift of Oregon nuts to its customers.

Thanks to the logging railroad, the West had increased its cut of timber by 200 per cent in 20 years.

Despite the aura of well-being which surrounded Americans in the last years of the Jazz Decade, there were some unhealthy economic symptoms showing up in the timber industry. In the seven years following World War I, more than 3,000 lumber mills in the South had folded for lack of timber. In the West, 29 per cent of the mills were down in 1928 for lack of business.

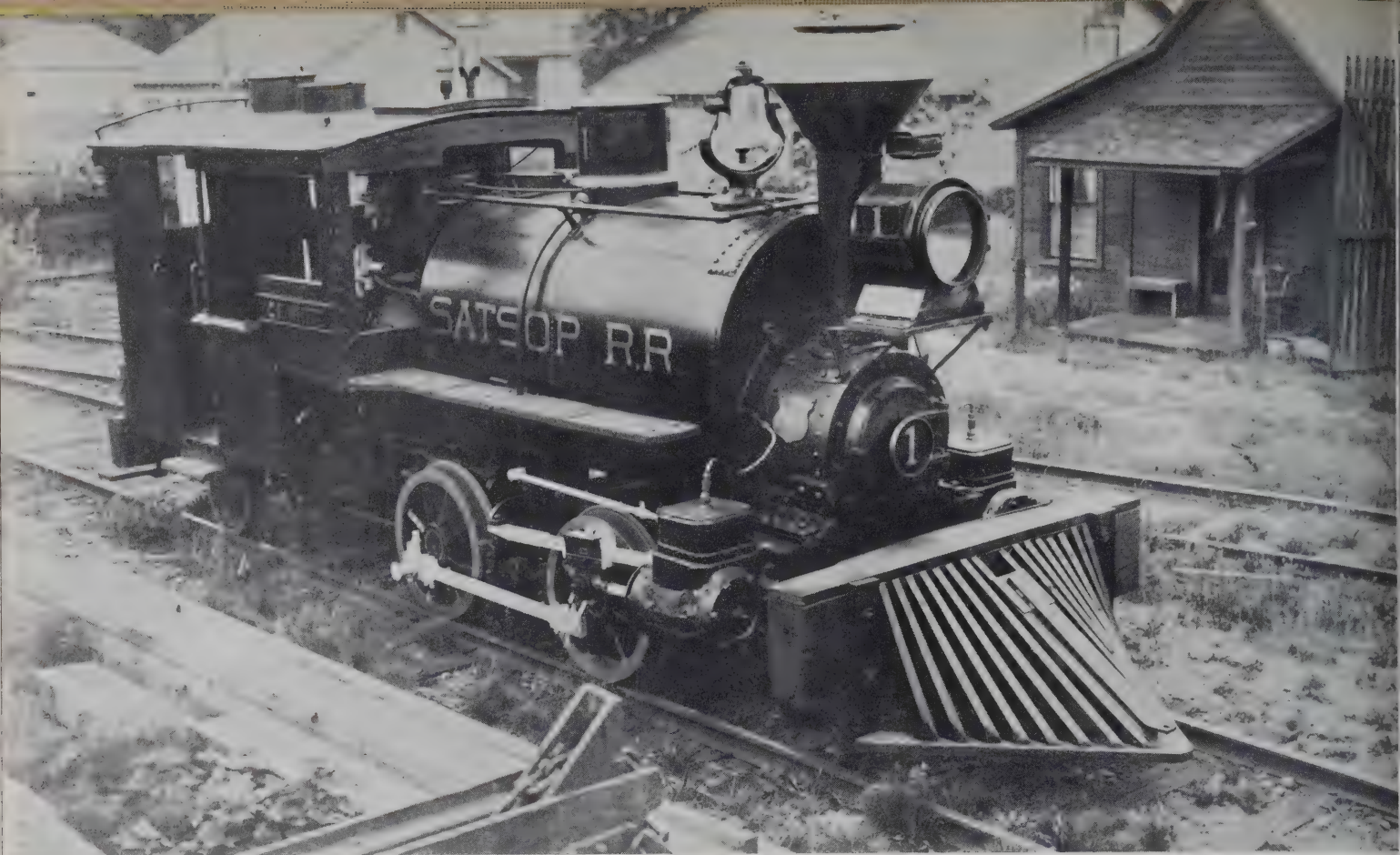
R. A. Long of Long-Bell Lumber Co. assured his associates that "the setbacks in the lumber industry of the last year are no more serious than those depressions which have occurred at intervals during the past 50 years."

When Black Friday hit Wall Street in October of 1929, nearly half of the nation's lumber mills were already idle. Two years later, four out of five mills were down.

The timber industry staggered. As the per capita consumption of lumber slid to an all-time low, logging and lumber companies merged, reorganized, folded. Woods camps were abandoned and padlocks went on the mill gates. In Oregon alone, more than two million acres of forest land became tax-delinquent. The whistle in the woods was heard with decreasing frequency.

Operators consoled each other with such comments as, "I'd burn the mill down, but business is so bad I can't afford the insurance."

The Depression of the 1930's foretold the inevitable demise of the steam logging road and dealt it a near-fatal blow. Small logging opera-



WOOD-BURNING PORTER locomotive was built for Satsop Railroad in 1885. Eventually it was inherited by Simpson Logging Co., which named it "C. F. White" in honor of a pioneer engineer and placed it on display at Camp Grisdale, Wash.

tors by the dozen quietly went under and sold their railroads and equipment for junk.

"The Trinidad," one of the first locomotives to be used in Humboldt County in the '70's, was scrapped and made into steel cables for the San Francisco-Oakland Bay Bridge. Rails of the Filion Bros. line were pulled up and sold to a railroad operation in the Philippines. Like many another operator, Henry McCleary sold his rails to Japan for conversion into steel.

The 100-ton Shay locomotive that sold new for \$20,000, now had a true value of \$5 a ton for scrap.

In 1931, one strapped lumberman advertised his 300-foot steel bridge for sale. The hard-pressed operator who was able to sell off his equipment was among the lucky ones. Others left their steel in the woods to rust.

For a number of years, scarcely a company in the industry could record a profit, and many large woods operations were curtailed in favor of less expensive contract logging. Those operators who managed to stay in business looked around for economical short cuts all along the line.

Sticking out like a sore thumb was the logging railroad. It had gradually developed into the most costly, though necessary, phase of the logging business. It often represented 40 per cent of the cost of logging. But by 1930, a reasonable substitute was available.

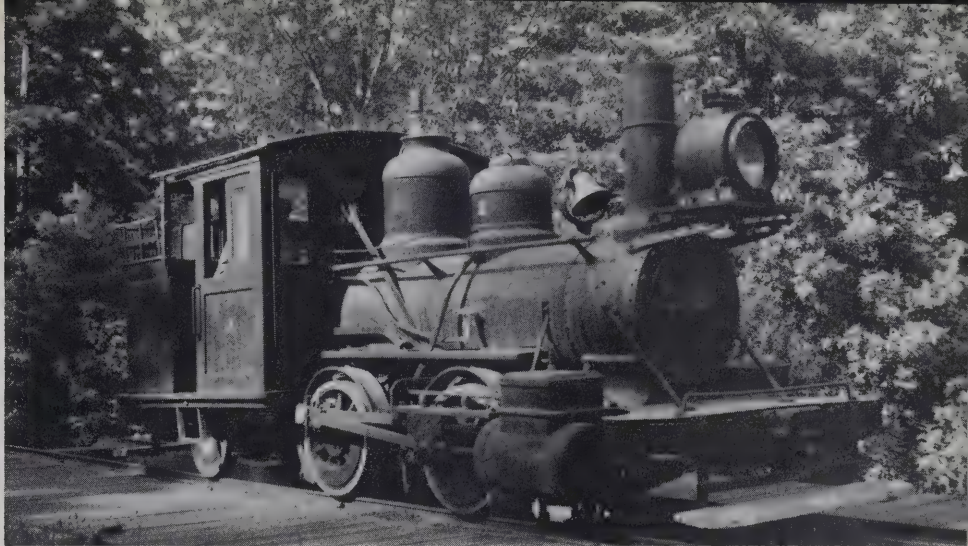
The auto trucks had been clambering around the western woods since 1913. Oscar Lindstrom started the revolution in June of that year when he converted a beat-up Kelly-Springfield bus to a log-hauler of sorts.

The first two-wheeled semi-trailer came along in 1915, the same year that Paul F. Shoemaker of Harris Creek Lumber Company cranked up Idaho's first log truck.

A year later, the Pearce & Balch mill acquired a gasoline lorry and *The Timberman* reported that "other operators are watching the results with interest."

World War I demonstrated the usefulness of the motor truck and stimulated the manufacture of more powerful models. By 1920, the editor of *The Timberman* had been convinced. "The experimental days of the motor truck are behind us," he prophesied, "and a new field

CASPAR, SOUTH FORK & Eastern Railway's Number 2 was built by Baldwin in the mid-'80's and is now on display at Caspar, Calif. (Harold K. Vollrath)



for their distribution is rapidly opening up."

The editor of the rival *West Coast Lumberman* had to agree. "The logging railroad with its great capacity and low operating expense will always have its place in large operations," he said, "but the motor truck with its less expensive roadbed, lower initial expense, ability to negotiate sharper curves and hence enter rough country for small operations, has become a part of the logging industry to stay."

In these early days of truck logging, only gasoline motors were available, and the unwieldy vehicles remained below the five-ton class. Many of them required plank roads, and some had to be hauled up and down hillsides by cable because they lacked the power or brakes to negotiate the grade.

Rudolf Diesel didn't have the logger's problem in mind in 1892 when he patented his oil-burning engine, but his improvements over the gasoline engine brought another revolution to the business of harvesting timber. In the late '20's, a few loggers were trying out the heavier, but more powerful Diesel trucks for woods chores, causing the editor of *The Timberman* to exclaim, "We are in the wireless and airplane age, and anything is possible!"

By the time the editor compiled his 1930 survey, gasoline and Diesel trucks were hauling about six per cent of the logs which reached the mills. But they were doing it at a lower cost than the railroads, a factor of considerable timelines to Depression-hit timbermen.

Meanwhile, the internal combustion engine had been advancing on the steam locomotive from another direction. First electricity, then gasoline and now Diesel oil had been touted as the coming fuel for logging locomotives. By 1930, a half-dozen other companies had followed Red River Lumber Company in applying Diesel

locomotives to logging work and helped make clearer the shape of things to come.

Of the five basic types of locomotive power now available, the reciprocating steam model was rated fifth and last on the list for thermal efficiency at the drawbar; third in capacity for work; and fifth in over-all performance. The Diesel locomotive ranked higher in all categories.

During the '30's, logging operators here and there hesitantly added a Diesel job to the roster. The initial cost of the equipment was much higher, but the budget-eating, day-to-day operating costs were lower than the steam locomotive. Southwest Lumber Mills found that their new Diesel was using 160 gallons of fuel oil a day, compared with 600 gallons in their Baldwin steamer.

The slow infiltration of the comparatively quiet, glamorless Diesel locomotive was resisted at first by the engineers. "They're trying to turn me into a white-shirted woods chauffeur, and make the fireman a filling station attendant," grouched one old hogger, who probably spoke for all the rest.

But sentiment had already lost out to economics. Diesel locomotives, tractors and trucks continued to eat away at the steam logging railroad.

Between 1932 and 1935, the number of logging truck permits in the West had doubled. Before the Depression had run its course, more logs were being hauled to the mills on rubber tires than on flanged wheels.

Other changes were taking place in the woods, too, that would replace the highball with the slow bell.

Timber had become more valuable over the years. No longer could citizens of the West go onto the public domain and legally help themselves to government timber. On patented lands,



the stumpage that was sold in the Nineties for from \$1 to \$20 an acre was worth three, four or ten times that amount in as many years. The first, faint overtures to forestry—protection of the standing timber—were put into practice.

Once logged, the land itself was considered worthless. It was a fire hazard to the surrounding timber and the mounting taxes on it were not worth paying. "The great opportunity in logged-off lands," advised one authority in 1913, "is found in dairying, cattle and hog-raising."

Not a few loggers agreed. Craig Mountain Lumber Company was then clearing its cutover Idaho lands as rapidly as possible and seeding them down in grain. As early as 1891, Occidental Mill Co. was reseeding its cutover to grass, and running cattle which supplied the logging camp with meat. Merrill & Ring Logging Co. was doing the same nearly three decades later. Some redwood lumber companies got together in 1912 and planted 10,000 acres of cutover with apple trees. Many others restocked with Australian eucalyptus. Union Lumber Co. tried walnuts.

Most logging companies attempted to sell off the cutover areas to farmers. Easy payments were available and thousands of "stump ranches" came into existence. Practically no one had yet discovered that most of these logged-off lands could produce only one dependable crop—trees.

As late as 1918, the timber industry was cutting trees four times faster than they were growing them. The planned farming of trees,

as practiced by European foresters, was not yet practical.

A major hindrance to the establishment of good forestry on private lands was high taxes. Much of the early cutover reverted to state and county governments for non-payment of tax levies. Gradually, local agencies came to realize that timber was their golden goose, and anything that encouraged the perpetuation of the forests could produce golden eggs.

Weyerhaeuser Timber Co. hired its first full-time forester in 1924. Two years later, Humboldt Redwood Reforestation Association was able to turn over 9,000,000 seedlings to its members for replanting logged-off land. Larger companies began buying up cutover land instead of trying to sell it. Under the laws of what the forestry schools call economic forestry, timber conservation became practical.

The fast cutting and wasteful timber stripping of past years was slowly replaced by timber growing and cropping. The influence of the foresters was being felt and lumber companies adopted slogans like "Timber is a Crop" and "Trees Forever."

New products, and new milling and logging techniques were able to make use of two-thirds of the tree, where at least half the tree's volume was once left to rot in the woods. An old-time trainman reported that "we don't leave enough of the tree back there on the ground to make a woodpecker's lunch."

The new era of woods management made the logging railroad less and less important. In the pine country, Clearwater Timber Co. had pioneered selective cutting, in which only a few mature trees were harvested from each stand. A similar practice was inaugurated in the redwood region. Selective cutting by area, or block logging, came into style in the Douglas fir region. Everywhere in the West, the practice of cutting over large areas was abandoned in favor of selective logging, leaving seed trees and small trees for the future. Without large volumes of logs available in small areas, it became too costly to push railroad tracks into the woods. The more maneuverable truck took over the spur line duties of the railroad.

The first tree farm was dedicated in 1941 on the site of Henry Clemon's old rail show in western Washington.

When war came that year, it brought mixed blessings to the logging railroad. Once again the nation needed timber in a hurry, and the highball days were revived for a final, brief



fling. Gasoline, tires and new trucks were hard to come by, and the few operators who still had railroads patched up their equipment to help turn out a new high volume of logs. But a good many operators succumbed to another appeal to their patriotism. They turned in their old rails, locomotives and logging machinery in an unprecedented flow to the scrap iron furnaces. Among the little-known casualties of World War II were a number of locomotives of priceless historical value. One of these was "The Ant," which had been the first narrow-gauge engine built on the Pacific Coast, the first logging locomotive in the Columbia River area, the first coal-burner in Washington and the first locomotive in the Puget Sound area.

Just before Pearl Harbor, there had been 4,000 miles of logging road in the West, and 500 steam locomotives. Soon after Hiroshima, both figures had been halved. Not a logging railroad

was left in New Mexico, Nevada, Utah or Wyoming in 1947.

Scrap prices climbed from around \$10 a ton in 1942 to \$40 in 1946, making some steam locomotives worth more as junk than as log-haulers.

A favored few locomotives were painted up and sent to foreign lands for industrial uses of various kinds. The nation's only two narrow gauge Mallets were sold by Sumpter Valley Railway in 1947 to International Railways of Central America. Over the years, other logging locomotives had been shipped to Alaska, China, Australia and the Philippines. Some were converted to stationary boilers in lumber mills and one was hauled off to wind up her days providing hot water for a laundry.

Logging costs rose in the past-World War II period, and the marginal railroad operation became sensitive to other pressures. A boiler explosion on Ralph L. Smith Lumber Company's



RESTORED "MINNETONKA" is now used by Northern Pacific for exhibits and special events. NP re-acquired its Number 1 in 1932 by giving Polson Logging Co. an 80-ton freight engine in exchange. (Seattle Historical Society)

line in 1948 took the lives of two trainmen and influenced the decision to abandon railroad operations soon after. The end came for Cowlitz, Chehalis & Cascade when construction of Mayfield dam doomed part of its right of way. Port Angeles & Western Railway folded under the weight of a million-dollar damage suit filed as a result of a forest fire its locomotive may have started. Flood waters from the new Shasta dam closed in on the California, Shasta & Eastern tracks. A lengthy strike of loggers caused the end of operations on the 70-year-old Casper, South Fork & Eastern Railway. Heavy storms of 1948, which washed out trestles, caused Biles-Coleman Lumber Co. to abandon its narrow gauge line.

The need for new highways took a heavy toll and motorists today on many of the West's most scenic routes do not realize that they travel on

parts of old logging road rights of way. Among them are U. S. Highway 34, the main route through the Rocky Mountain National Park, which once supported the trains of Rocky Mountain Railway. Brookings Lumber Co. deeded its old right of way to the county to form a part of the famous Rim of the World Drive in the San Bernardino Mountains. The all-year Feather River Highway runs for a number of miles where the whistles of Sierra Valleys Railways trains once echoed. Intermountain Railway's right of way was sold to the Idaho highway department for \$45,000 and part of the Mt. Baker Highway was originally graded for Allen-Nolte Logging Co. trains.

Some logging lines were abandoned in favor of trucks when it was found that conversion to Diesel locomotives would require the rebuilding of the entire railroad.

The camp cars, coaches, log trucks, crummies and other rolling stock of the logging roads were usually burned to recover the metal for scrap. A notable escapee was "The Potlatcher," a combination car of Washington, Idaho & Montana Railway, which now serves as a concession stand for the Clover 4-H girls of Potlatch.

Some bunkhouse cars were converted to permanent camps. Others were sold for use as summer homes, tool sheds, garages and auto court rental units. One wound up as a tavern on U. S. Highway 97.

Junkers of Cowlitz, Chehalis & Cascade Railway equipment found an unusual buyer for the steel rails. They were shipped to India for use as power poles. The buyer explained that the natives there had a habit of chopping down the wooden ones for firewood.

As the scrapper's torch cut into the dwindling numbers of steam logging locomotives, there were those who realized that efforts should be made to preserve a few of the prime symbols of logging's highball days.

Northern Pacific Railway made the first move. Chicago's Century of Progress Exposition was coming up and NP looked around for its first locomotive, "The Minnetonka," for an historical exhibit. As rumored, the 1870 model Smith & Porter was rusting away in the woods of western Washington. After serving NP for 16 years in construction work on both sides of the Rockies, Number 1 had been sold to Ainsworth & Simpson Lumber Co. and then to Port Blakely Mill Co. It was bought in the '90's by Polson Bros. Logging Co., and hauled logs until 1928, when it was abandoned in the woods near Hoquiam. "Ol' Betsy," as the Polson loggers called the little 10-tonner, had put in 58 years of hard service. Things were slow in the lumber business in 1932, and the Polsons jumped at the opportunity to trade a worn-out "Betsy" even up for NP's Number 51 consolidation type locomotive.

Completely reconditioned and restored to Number 1 on NP's roster, "The Minnetonka" became a popular attraction at the Century of Progress, the New York World's Fair and the Railroad Fair. The Cinderella locomotive, equipped with a loaded log car, has been assigned to permanent exhibit duty and now makes the rounds of civic celebrations along the NP line.

Number 1 of Mattole Lumber Co. had received considerably worse treatment than "Ol' Betsy" before she was discovered in 1950 rust-

ing away in a river bed. Gus Haggmark and Henry Sorensen bought the half-buried Vulcan product for \$1, restored it, and now run the little 0-4-0 on their private line near Eureka.

In his youth, Weaver Clark had worked for Oregon-American Lumber Co., and when the old mill was closed in 1957, he asked the manager if he could spend 15 minutes wandering around the place with his memories. The nostalgic moments had a strong effect on Clark, and he was soon back in the manager's office writing out a check to buy the company's two prairie-type locomotives. They are destined for eventual exhibit.

Other sentimentalists have helped save the steam logging locomotive from oblivion. Pioneer Box Company's 0-4-2 tanker was bought by Robert Day and now rests in the Santa Fe roundhouse at Los Angeles. The members of Puget Sound Railway Historical Association have picked up a number of woods locomotives for their three-quarter-mile excursion line near Snoqualmie Falls. C. O'Connor of Pasadena bought Rogue River Valley Railway's Number 2 locomotive. Hobart Mills Number 5 Baldwin is occasionally seen in a Warner Bros. movie or television production.

The logging companies themselves have made the greatest effort to preserve memories of the past. They have contributed most of the locomotives now on permanent display.

Perhaps the best collection of old woods locomotives will be found in the proposed transportation museum to be located near the maritime museum in San Francisco. Scheduled for display are locomotives once owned by Dollar Lumber Co., Lorane Valley Lumber Co., and Hobart Mills.

The derailment of Number 7 Mallet which ended rail operations of Deep River Timber Co. in 1955 brought good fortune to a group of rail fans in Seattle. The 1909 model Baldwin had been turned over to an insurance company for salvage, and Charles Morrow was able to buy it "as is, where is," for the scrap price. The bargain was not without its problems, however. The timber company tore up the tracks soon after the wreck, leaving Number 7 stranded on her side in the woods. To remove it, the amateur railroaders in 1960 had to cut up the 120-ton locomotive into pieces and haul it out by truck. Looking over the parts scattered on the ground, Morrow commented, "This is probably the only do-it-yourself locomotive kit in history."

Another stranded locomotive moulders in



SHAY NUMBER 4 of Diamond & Caldor Railway crossed this bridge over the Consumnes River uncounted thousands of times in its half century of service. The two-truck, narrow-gauge locomotive was donated to the El Dorado County Fair in 1953 and is now on exhibit at Placerville, Calif.

the woods of Humboldt County, cut off by a fire in 1945 which burned out a series of trestles. Hammond Lumber Co. decided that the railroad was not worth rebuilding and left the rod locomotive standing on the isolated section of track. A few rail fans know its location and have made efforts to protect the orphan for what they hope to be eventual rescue.

In spite of their worthwhile efforts, the historical societies, rail fans and lumber companies have managed to save a ratio of only one in 50 of the locomotives that served in the western woods. Forty of these are now on permanent display and another dozen or so are awaiting relocation to some type of exhibit.

Fewer than 30 steam locomotives remain in use or capable of use in the early 1960's. A third of them are owned by Rayonier, Inc., the last of the great steam logging railroad operations.

Running on Olympic Peninsula rights of way that were originally put in by a half-dozen predecessors, the well-kept Rayonier steamers seem destined for a long life to come.

Rayonier's last spur logging operation, in which the cars were loaded at the felling site, took place in 1957. Medford Corp. operated the last all-steam rail show in the West until the spring of 1959. Logs were yarded to a McGiffert loader for placing aboard the cars and then taken down the spur by a Shay and on the main line to the mill by a 1924 model Baldwin 2-8-2. The old type of spur yarding-loading operation is still practiced occasionally at Weyerhaeuser Company's Klamath Falls branch, but Diesel equipment long ago replaced steam.

"We just can't afford spur logging anymore," said the woods boss of one remaining rail operation.

For the optimistic, there were a few straws to grab in steam's waning years. Craig Mountain Railway retubed its Heisler in 1956. Longview, Portland & Northern Railway retubed its Number 680 Baldwin consolidation in 1957. Paramount Pictures in 1956 put a new boiler in its narrow gauge relic that had once hauled logs for a living. The Shays operated by Klickitat Log & Lumber Co. are given a steam bath at the end of each day's run. Mr. Styles of Railway Equipment Co. in Portland reports that he maintains a large stock of steam locomotive parts.

Weyerhaeuser Timber Co. opened up its Springfield operation in 1949 and built a brand new railroad system to provide it with logs.

"Don't go around knocking our pike as a 'quaint anachronism'," warned a college-educated woods boss recently. "This will be a railroad show as long as the timber keeps growing and until trucks or helicopters can make our long-run haul more cheaply. And that could be a long time."

An engineer who pilots a Rayonier steamer on its daily run is fond of saying, "I ain't bought any white shirts yet to wear on a Diesel."

But behind the bravado, time is running out. Each economic recession of recent years has brought the end of more logging lines, the disposition of additional locomotives. The steel strikes of the '50's placed a premium on scrap and decimated the steam rosters.

The last Brooks locomotive made its final run on the Harbor Plywood line in 1957. The last Schenectady in logging service made the run to limbo in 1959. The last of the steam loco-

motives that hauled logs for Northern Pacific was scrapped at Tacoma in 1960. The fire went out in the last Cooke product in 1961.

On the anniversary of western steam logging's 92nd year, Metro-Goldwyn-Mayer sent Georgia-Pacific Corporation's last active steamer to a spectacular end at the bottom of a canyon for a scene in the movie, "Ring of Fire."

By 1961, Editor William S. Young of *Short-Line Railroader* could report that there were less than 50 Shays left in North America. Of the hundreds of Climaxes which snorted through the western forests, not one was available for service.

Today a graduate forester edits *The Timberman*, and the annual summary of logging railroads is no longer worth compiling. Of the 3,000 different log-hauling lines that sprouted between the trees, less than three dozen remain. The 7,000 miles of track that crawled through the pines, firs and redwoods in 1930 has dwindled to less than 1,000. Spur logging is dead. Young trees grow between the rotting ties.

Gone are the Knothole Central, the Wooden Axle Southern, the Dutch Pacific and their counterparts in all the western states. Gone too are most of the woodsmen who named them and teamed with the little railroads to harvest the greatest crop of logs in history.

The logger's beloved steam pot has clanked her way to oblivion—victim of a new philosophy of woods management and the devastatingly efficient engine of Rudolf Diesel. Progress has reduced to a memory the sound of the steam whistle in the woods. The highball days have come and gone.

ABANDONED machine shop of Schafer Bros. Logging Co. resists for awhile the encroachment of weeds, trees and time.





OLD NUMBER 7 of Klickitat Log & Lumber Co. still makes a daily log run up and down the Klickitat River canyon in Washington. The 90-ton Shay is given a steam cleaning each day. (Henry R. Griffiths, Jr., photo)

LOCOMOTIVE NUMBER 3 of Medford Corp. still makes an occasional run into the pine forests of southern Oregon. The Mikado type 2-8-2 was built by Baldwin in 1924 and now serves as relief to the company's Diesel locomotive.



TWO-TRUCK SHAY once used by Oregon-American Lumber Co. has been placed on display at Vernonia, Ore., by Long-Bell Division of International Paper Co.





TRESTLE OVER TEN CREEK was built by Snoqualmie Falls Lumber Co. in 1921. Decaying remains were photographed again in 1944. Trees have since grown so large that the site is unphotographable.





NUMBER 7 of Deep River Logging Co. was one of the first Mallets built in America. The 1909 model Baldwin derailed in 1955, bringing the decision by Deep River to abandon its railroad operations. Railfan C. G. Morrow bought the distressed locomotive "as is, where is," and planned to display it in a rail museum at Snoqualmie Falls, Wash.





LOCOMOTIVE ROSTER of Weyerhaeuser's Vail logging operation in 1938 consisted of a magnificent array of steam power. Number 103 was a Baldwin Mikado of 86 tons built in 1913. Three Mallets, two Shays and another "Mike" are also in the line-up.

TAKING ON WATER near Hambone is a double-header of Prairie type locomotives of McCloud River Railroad. One of these 2-6-2's still makes an occasional log-hauling run.





WHISTLE SIGNALS

The State Safety Board of Washington in 1920 issued an order to standardize locomotive whistle signals on logging lines. They are similar to those used elsewhere and on mainline railroads.

(0: short; -: long.)

0 stop; apply brakes

00 answer for any signal not otherwise provided for; (highball)

-- release brakes, proceed

--- when running, train has parted

000 when train standing, back up

--00 approaching highway crossing at grade

----- approaching stations, rollways, chute crossings, junctions and derailleurs on the main line

00 00 00 air brake sticking

A succession of short sounds of the whistle is an alarm for persons or livestock on the track.

A Personal Note

The steam logging railroad has many friends. They have been discovered in all the Western states covered by this book, and in a number of less-fortunate locations as well. Among them are the old-timers who recall the days when the steam whistle was the heart-beat of the woods. They include historians, editors and librarians who have never been aboard a trainful of logs. Other dedicated supporters are found among the rail fans who have salvaged valuable bits of information from the maw of time. All admit to the charge of being unashamed sentimentalists.

'If you're going to write a book on logging roads," one old-timer advised, "you can't lie fast enough to keep up with the honest facts."

The woodsman's comment was a fair assessment of the nine decades of western railroad logging. Keeping up with the honest facts required assistance from many quarters.

The list of contributors to this book must begin with co-worker John Blake. Several years ago, he was unable to find adequate reference material for a railroad story planned for *Weyerhaeuser News*, forcing us to agree that this book should be written.

Stewart Holbrook, Jim Stevens and Dr. Donald Clark, each an author much better qualified to tackle the subject, offered early encouragement. Indeed, they have involuntarily contributed in more tangible fashion by compiling information in their own works which has been reproduced herein.

Editor Freeman Hubbard of *Railroad Magazine*, Lucius Beebe, George Abdill, Russel Lynes and Friend John Wesley Noble are other by-liners who lent a hand when most needed.

At the risk of name-dropping, let credit be given also to the greats of the timber industry, such as Arch Whisnant of the Pacific Logging Congress, Thornton Munger, Hal Ogle, Tom Murray and Ted Gilbert.

This book's Who's Who is a fortunate one, including as it does Le Von Dunford of Southwest Forest Industries, Bob Lee of Georgia-Pacific Corp., Jim Durgan of St. Regis Paper Co., Tom Mutchler of International Paper Co., Alden Ball of The Pacific Lumber Co., Dave James and Oscar Levin of Simpson Timber Co. and Allen C. Smith of Medford Corp.

The patient people at Weyerhaeuser Company who indirectly served the reader include Vic Tennant, Jay Gruenfeld, Tom Orr, Art Smyth, Ted Durment, Phil Hogan, Al Johnson, Ed Mathewson and the late Byron Oyster. Artist Dick Londgren accurately reproduced the logging road insignia which decorate the end sheets.

Essentially every photograph on railroad logging in the files of the U.S. Forest Service was made available through the diligence of Public Information Director Clint Davis. The same generous overture was made by Mac Eppley of Western Pine Association, Bob Mahaffey of West Coast Lumbermen's Association and Phil Farnsworth of California Redwood Association.

John C. Kosky of Baldwin-Lima-Hamilton turned his office upside down to provide photos and information for this project, as did Elwood

Maunder of Forest History Society and Ralph Bell and James K. Gibson of California Public Utilities Commission.

This essay turned out to be a better one for the cooperation of Joseph C. Larin, J. C. Rutledge, Albert Farrow, Jim Gertz, Ray Nelson, Professor Jonas Jonasson and John T. Labbe. Editors Al Arnst of *The Timberman* and Donald Duke of *Pacific Railway Journal* were also helpful.

Cumulative credits go to many courteous people in our libraries across the land, from Ed Maconomy at the Library of Congress to Richard Berner at the University of Washington. There was Miss Mary Kobitich at the Tacoma City Library, Miss Alta West at the Washington State Historical Society library and Mrs. Frances Buxton of the California Room at the Oakland Public Library.

Miss Nancy Hacker and Tom Vaughn of the Oregon Historical Society performed beyond the call of duty, as did W. B. Beatty of Amaragosa Memorial Library and Mrs. James G. Maple of the Coos-Curry Museum.

A trio of experts nearly became co-authors. The help of Nannie Escola of Mendocino, Calif., Chaplain Homer Benton of the U.S. Army and Jack Slattery of Jack's Photo Shop in Coos Bay, was invaluable.

The author hesitates to list his mother as a contributor to the book, lest it seem a bit of gratuitous sentiment. Yet the many months of tedious research accomplished by Mrs. Maynard Fraser in the California libraries cannot pass without written acknowledgement.

While it took many people to provide the information for this essay, the author alone assumes responsibility for the inevitable inaccuracies which time is bound to discover. The very reason for this book, a lack of organized information on the subject of railroad logging, may account for some factual shortcomings.

Publication has been delayed in order to conduct a second search for printed materials which might provide clues to long-vanished logging pikes. At press time, there was reasonable belief that every available printed source had been consulted in the compilation of the appendix listing.

There may be some raised eyebrows among fellow rail fans over the labeling of certain railroads as logging lines, just as there may be over the exclusion of certain others. From the beginning of this project, only those roads have been considered whose traffic at some period was 50 per cent or more in logs. Lumber-hauling lines have been eliminated, as have the big mainline railroads and their subsidiaries.

The friends of logging railroads were found everywhere, and many of them cannot be listed here. To all the contributors, and especially to the woodsmen of the West's highball days who made a story worth telling, this effort to record a fading era is respectfully dedicated.

GLOSSARY

The jargon of the railroader is a formidable collection of expressions which has been accumulating since railroading began in the 1830's. But it is no match in size, color or profanity for that of the logger. Practitioners of the two occupations find cause for mutual respect and admiration in each other's language.

As true connoisseurs of the colorful word, loggers adopted many of the railroaders' terms for their own. The influence was apparent in such expressions as "standard gauge," which came to mean anything that met with the logger's pleasure, and "short of cars," which described a state of unemployment.

"Highball," originally a railroad signal ball raised and lowered on a mast, became the short, double-whistle signal for "let's go," and still later, meant a fast, often careless logging operation where forest conservation practices went unheeded.

"Pull the pin," is generally understandable today as a term for departing from the scene. It came from the act of removing the securing pin in the old link and pin coupler on railroad cars. "In the clear" and "pull freight" are other loggerisms borrowed from the railroaders.

Further evidence of the linguistic melding include such terms as:

Balling the jack—highballing a logging locomotive.
Boomer—migratory railroader or logger.

Count ties—to quit or be fired from a logging camp.

Crown sheet—flapjacks bearing bubble holes similar to those in a locomotive crown sheet.

Dump the pan—to discard or spill something, as the engine crew did when ridding the locomotive ash pan of its fire.

Fire box—a logger's stomach, particularly after a week-end in town.

Has his head cut in—straight-thinking man who is as much under control as a train with its air brakes cut in.

Hole in the boiler—ulcer or stomach ailment.

In the rip track—man hospitalized.

Rolling stock—doughnuts.

Side rod—loading foreman of a jammer; an executive assistant.

String of flats—stack of hotcakes, after a train of empty flat cars.

The following glossary of railroad logging terms is, unfortunately, incomplete. The reasons are both spatial and esthetic. Dean Walter McCullough, doing research for "Woods Words," published by Oregon Historical Society in 1957, came across more than 5,000 distinct terms used in the western timber industry. Many more of the woodsman's expressions were supremely descriptive, but equally unprintable.

Some of the woods words below come from Dean McCullough's book, as well as Wilbur A. Davis' "Western Folklore," and "Logger's Lingo," a study by American Forest Products Industries. The following compilation owes much to these sources, as well as to numbers of anonymous and unsuspecting verbal contributors.

ENGLISH-LOGGER'S DICTIONARY

BRAKEMAN—Casey Jones, pin head, iron bender, don-icker, ground hog, block head.

CABOOSE—zoo, parlor, hut, coop, brain wagon, cage, hack, hearse, kitchen, louse cage, shack, shanty, ape wagon, crummy, bouncer, buggy, chariot, dog house, hay wagon, cabin car.

CONDUCTOR—con, skipper, crumb boss, shack; senior conductors rode the caboose as hind end shacks while their juniors rode swing shack in the middle of a long log train or the smoky end at the locomotive.

CREW CAR—crummy, galloping goose, skunk, doodle-bug, mulligan, speeder.

DISPATCHER—train delayer.

ENGINEER—hogger, Casey Jones, eagle eye, runner, log hauler, throttle jerker, hoghead, lokey puncher.

ENGINE HOUSE—pig pen.

FIREMAN—tallow pot, fireboy, bakehead, greaseball, smoke boy.

FLAGMAN—parlor boy.

FORESTER—fern hopper.

LOCOMOTIVE—jack, lokey, hog; iron ox (early usage); mill, pot, boiler and coffee grinder for old or troublesome models; dinky, goat and tea kettle for small ones.

LOG POND—drink, dump, booming grounds.

LOGGING ENGINEER—scenery inspector or S.I.

MECHANIC—nut buster, nut splitter, hostler; his boss was the "master maniac" (mechanic).

RAILROAD—pike, peavine, track.

REPAIRMAN—car knocker, car toad, tinkerer, car whacker.

SPARK ARRESTER—(smokestack device to prevent spewing of sparks) bird cage, balloon, spark cap.

SWITCH ENGINE—shifter, switcher; in the woods a goat.

SWITCHMAN—snake.

TURNTABLE—merry-go-round.

LOGGER'S - ENGLISH DICTIONARY

ADVERSE—uphill railroad grade.

AIR ARTIST—locomotive engineer skilled in using air brakes.

BALD WHEELS—locomotive driving wheels with flanges removed to help prevent derailments; also blind tires.

BALDFACING LOGS—loaded log cars being pushed by locomotive at rear.

BAKE A CAKE—to get up steam; also to get her hide tight.

BEAT THE THROTTLE WITH A STICK—full speed; same as fogging (with steam); also widen on 'er.

BARNEY—power car on an incline railroad.

BEND THE IRON—to engage a switch.

BOARDING CAR—a railroad camp cookshack on wheels.

BONE YARD—end of the line for rolling stock; also rip track, scrap track, dead line.

BROKE—past tense of the verb “to brake,” as “He broke (served as brakeman) on a logging pike.”

BROWNIE—demerit mark assessed for rule infraction.

BUNK—the part of a logging car or truck upon which logs rest

CANDY RUN—short or easy haul; gravy run.

CHANCE—logging show, or operation; a railroad chance was one using railroads, while a summer chance was one loggable only in good weather.

CHERRY PICKER—car-mounted crane used to lift logs and equipment which was developed by Ronald McDonald when he was the woods boss at Cherry Valley Logging Co.

CLEAN THE CLOCK—to cause the brake pipe pressure gauge needle to drop to zero when brakes are applied suddenly.

COMPANY NOTCH—that point on the locomotive throttle which gives the most pulling power with greatest efficiency.

DECLINE—(opposite of an incline) method of hoisting loaded log cars by cable up steep grades.

DINKEY-SKINNER—mainline engineer’s description of a logging road engineer.

DRUNKARD—the loggers’ passenger train returning to camp from a night or a week-end in town.

DYNAMITE ’ER—to stop suddenly; plug.

GANDY DANCER—railroad section worker; one who hides gravel under and around the ties following ballasting; steel man.

GRADE DESTROYER—log car with a bulkhead at one end to prevent loss of logs on incline railroads.

GYPSY—locomotive equipped with steam-powered winches used to bring in logs; a donkey rig built onto the locomotive pilot.

HIT THE PIKE—head down the railroad track toward town; also hit the steel; mix me up a tie pass.

HODAG—legendary beast of the woods; a fearsome animal whose deeds were often recounted to impressionable young scissorbills.

HOMESTEAD—to jump off a runaway train; also hit the brush, unload or join the birds.

HUMPBAC—piece of metal which was spiked to the ties and used to guide the wheels of a derailed car back onto the tracks.

INCLINE—method of lowering loaded log cars by cable down grades too steep for locomotive power.

JACK SCREW—large hand-operated jack used to move logs before steam machinery came to the woods.

JAMMER—log loading machine which straddled the tracks, taking in empty cars at one end and disgorging loaded ones at the other; a slide-s jammer was a loader which moved along the top of empty flat cars on temporary track.

JILL POKE—sturdy pole with many applications in logging, one of which was to shove cars from a siding when no locomotive was available.

KING SNIPE—the steel gang boss.

KINK—section of poorly ballasted track warped by the sun.

LIDGERWOOD—car-mounted, steam-powered log loader and skidder which first appeared in 1882.

LINK-AND-PIN—primitive car-coupling method which caused many injuries to trainmen; also Lincoln pin.

LOCOMOTIVE CORD—stack of wood for locomotive fuel cut in two foot lengths and piled four feet high and eight feet long.

LOG JAM—results of a log train mishap.

LOWERING RIG—engine operated by steam, air or hydraulics to raise or lower log cars on an incline.

MAINLINER—logging locomotive engineer who handles his engine and himself as if they were on the Southern Pacific; a hot-rodder.

MAIN LINE—permanent, basic trackage of a logging road, as opposed to the branches and spurs which were usually removed as logging progressed; main gut; also used to describe large common carrier railroads.

McGIFFERT—track-straddling jammer or loading machine used in pine logging; a skidder employing booms for loading logs on cars at both ends.

MULLIGAN—rail vehicle used to haul woods crews to and from camp; originally the car which brought hot meals to the woods, and labeled for the frequent delivery of stew, or mulligan.

MUZZLE-LOADER—rail camp bunkhouse car with one door at the end.

NIPPER—steel gang worker who holds up ties being spiked to the rail.

NORTON JACK—hand-operated jack used in moving logs and rerailling cars.

PARBUCKLE—method of loading logs onto cars by employing a cross-haul line under the logs which, when pulled by the locomotive, started the logs rolling.

PONY EXPRESS—rail speeder which brings mail to camp.

POUNDING THE SCREEN—getting a better draw for the locomotive fire by hitting the spark arrester and shaking loose the collected carbon.

RELAY—rail that has been used and relaid in a new location.

ROCK—low grade coal for locomotive use; also known as “real estate.”

SCISSORBILL—student switchman or greenhorn in the woods.

SHOW—any logging operation or chance.

SIDE—complete logging operation, which may contain more than one setting.

SETTING—logging operation and equipment within yarding distance of a spar tree or loading machine.

SHOO-FLY—detour built around a slide, wreck or other obstruction; a route which winds around the hillside instead of employing a trestle or fill across a canyon.

SKELETON CAR—log carrier with frame in the form of a capital “I.”

SMOKE SIGNALS—the only way for the engineer to determine if another train was ahead on many logging lines; operating a train without proper orders.

SNIPE—beveling of log ends to aid skidding over obstructions or on the ties when trailed behind a locomotive.

SWITCH BACK—zig-zag railroad route built to overcome a grade too steep for direct ascent.

TRAILER—flat car pushed ahead of the locomotive to couple onto cars located on track unsafe to permit passage of the locomotive.

WANIGAN CAR—timekeeper’s headquarters and office car of a railroad camp.

WEAR A FEATHER—plume of steam coming from a locomotive safety valve which is blowing off.

BIBLIOGRAPHY AND REFERENCES

The publications listed here do not represent the full range of literature in the field of logging, and certainly not of railroading. The list has been compiled with gratitude for the contribution that each has made to this portrait of western railroad logging.

BOOKS

- | | | |
|---|-----------------------|---|
| A Century of Coos & Curry | Peterson & Powers | Binfords & Mort, Portland; 1952 |
| A Practical Evaluation of Railroad Motive Power | P. W. Kiefer | Steam Locomotive Research Institute; 1947 |
| A History of the State of Washington | Spencer & Pollard | American Historical Society; 1937 |
| Bonanza Railroads | Gilbert H. Kneiss | Stanford University Press; 1941 |
| Building a State | Frederick Shaw | Washington Historical Society |
| Casey Jones' Locker | | Hesperian House, San Francisco; 1959 |
| Climax—An Unusual Steam Locomotive | Taber & Casler | Railroadians of America, Morristown, N.J.; 1960 |
| Eighteen Men and a Horse Far Corner | Donald H. Clark | Metropolitan Press, Seattle; 1949 |
| Fourth Corner | Stewart Holbrook | McMillan; 1952 |
| Glory Days of Logging | Lelah Edson | Cox Bros., Inc., Bellingham, Wash. |
| Green Commonwealth | Ralph Andrews | Superior Publishing, Seattle; 1956 |
| Half Century in the Timber | Stewart Holbrook | Dogwood Press, Seattle; 1945 |
| History of Humboldt County | Leigh H. Irvine | Dogwood Press, Seattle; 1945 |
| | | Historic Record Co., Los Angeles; 1915 |
| History of Idaho | James H. Hawley | |
| History of Nevada | Sam P. Davis | Elms Publishing Co., Inc., Reno; 1913 |
| History of Placer County | Thompson & West | |
| History of Snohomish County | William Whitfield | S. J. Clarke Publishing Co. |
| History of Sonoma County | Honorio Twomey | Century History Co.; 1909 |
| History of Washington | Clinton A. Snowden | The History Co., San Francisco; 1888 |
| History of Pacific States | H. H. Bancroft | Binfords & Mort, Portland; 1949 |
| Longview | J. M. McClelland, Jr. | Caterpillar Tractor Co. |
| Men of Timber | | G. H. Hardy, Oakland; 1949 |
| Narrow Gauge Railways in America | Howard Fleming | |
| Oil Lamps and Iron Ponies | Shaw, Fisher, Harlan | Bay Brooks, San Francisco; 1949 |
| Pacific Lumber Ships | Gordon Newell | Superior Publishing, Seattle; 1960 |
| Pacific Slope Railroads | George Abdill | Superior Publishing, Seattle; 1959 |
| Railroad Man | Chauncey Del French | Macmillan; 1938 |
| Railroads Down the Valleys | Randal V. Mills | Pacific Books, Palo Alto; 1950 |
| Redwood and Lumbering in California Forests | | Edgar Cherry & Co., San Francisco; 1884 |
| Redwood Classic | Ralph Andrews | Superior Publishing, Seattle; 1958 |
| Redwood Railways | Gilbert H. Kneiss | Howell-North, Berkeley; 1956 |
| Santa Fe | James Marshall | Random House, New York; 1945 |
| Short Line Junction | Jack Wagner | Academy Literary Guild; 1956 |
| Tacoma; Its History and Its Builders | Herbert Hunt | S. J. Clarke Publishing Co.; 1916 |
| Tenth Brand Book, Denver | | Johnson Publishing Co.; 1916 |
| Posse of the Westerners | | |
| The Humboldt Ray Region, 1850-1875 | Owen C. Coy | California State Historical Ass'n., Los Angeles; 1929 |
| The Railroads and Steamers of Lake Tahoe | Owen McKeon | Western Railroader, San Mateo; 1955 |
| The Saga of Lake Tahoe | E. B. Scott | Sierra-Tahoe Publishing Co., Crystal Bay, Nev.; 1957 |
| The State of Washington | | Worlds Fair Commission, State of Washington |
| This Was Logging | Ralph Andrews | Superior Publishing, Seattle; 1954 |
| This Was Railroading | George Abdill | Superior Publishing, Seattle; 1958 |
| This Was Sawmilling | Ralph Andrews | Superior Publishing, Seattle; 1957 |
| Time, Tide and Timber | Coman & Gibbs | Stanford University Press |
| Untamed Olympics | Ruby El Hult | Binfords & Mort, Portland; 1954 |
| Washington: Northwest Frontier | Edgar I. Stewart | Lewis Historical Publishing Co.; 1957 |

PERIODICALS

- | | |
|--|--|
| Abbey's Register of the Northwest
Lumber Industry | Reports of the— |
| American Lumberman | California Public Utilities Commission |
| Blue Lake Advocate | Colorado Public Utilities Commission |
| Bulletins of the California-Nevada
Railroad Historical Society | Oregon Public Utilities Commission |
| Bulletins of the Railway and Locomotive
Historical Society | Oregon State Forester |
| Cathlamet Gazette | Washington Department of Public
Works |
| Columbia River and Oregon Timberman | Railroad |
| Daily Colorado Tribune | Reno Gazette |
| Del Norte Triplicate | Rocky Mountain News |
| Directory of Logging Railroads
Owned by Lumber Companies;
American Lumberman | Sacramento Bee |
| Directory of the Lumber Industry;
The Timberman | Sacramento Union |
| Four-L Lumber News | San Francisco Call |
| Fortnight Magazine | San Francisco Chronicle |
| Humboldt Standard | San Francisco Examiner |
| Humboldt Times | Seattle Post-Intelligencer |
| Hutchings' Illustrated California Magazine | Seattle Times |
| Loggers Handbook and Transactions of
the Pacific Logging Congress | Scientific American |
| Moody's Manual of Transportation | Short-Line Railroader |
| Oakland Tribune | Tacoma News-Tribune |
| Oregon Journal | The Clearwater Log |
| Overland Monthly | The Pony Express |
| Poor's Manual of Railroads | The Log of Long-Bell |
| Pacific Lumberman and Contractor | The Noyo Chief |
| Pacific Coast Wood and Iron | The Timberman |
| Port Angeles News | The West Coast |
| Portland Oregonian | The West Coast Trade |
| Quarterly of the California Historical
Society | Trains |
| Quarterly of the Oregon Historical Society | West Coast and Puget Sound Lumberman |
| | West Coast Lumberman |
| | West Coast Signal |
| | West Coast Timberman |
| | Western Railroader |
| | Western Railway and Logging Railroad
Directory; The Timberman |
| | Westways |
| | Weyerhaeuser News |

MISCELLANEOUS

- Brief History of Railroads of Oregon, unpublished manuscript by Haselton
- End of an Era, Rayonier, Inc.; 1959
- History of Tacoma Eastern Area, by Mrs. Jeannette Hlavin (unpublished)
- Humboldt County Souvenir; The Times Publishing Co., Eureka; 1904
- Logging in the Douglas Fir Region, U. S. Department of Agriculture; 1918
- Mechanization in the Lumber Industry, National Research Project; Report M-5
- Mills of the Sequoias, unpublished manuscript by Lizzie McGee
- Railroading in Mason County, Simpson Logging Co.; 1957
- The Development of Railroads in the State of Washington, unpublished manuscript by
Bruce Cheever; 1949
- The Lumber Industry in Washington, Washington Secretary of State's Office
- The Railroad Tie Industry in the Central Rocky Mountain Region, unpublished manu-
script by William H. Wroten, Jr.; 1956



APPENDIX

Logging Railroads of the West

It's often easier to retrace the right of way of an abandoned logging road through the second growth than it is to track down its vital statistics. Some of the log-haulers steamed into history with no printed evidence of their existence. Only a few of them reached that status which required reporting to a governmental agency.

The listing that follows represents the best available information from such sources as state railroad and tax commissions, locomotive sales records, contemporary publications and interviews with veterans of the highball days. The prime source has been the annual directories of railroad and logging companies issued by Abbey, *American Lumberman*, Moody, Poor, *The Timberman* and *West Coast Lumberman*.

Where possible, the location indicated is the site of the logging camp. Where there was more than one operation or where the logging site is not locatable on a modern highway map, the nearest town is given. Usually the town is the mill or railroad headquarters.

The same standard which was used in the selection of photographic and textual material applies: the railroad must have carried more logs than other freight or passengers for a substantial period. Many mill-owned lines which hauled lumber have thus been eliminated, though a few no doubt persist due to the inability to determine from this distance in time whether the railroad was coming or going in relation to the mill.

The railroad operations listed in capital letters are those in existence at press time. They are main line log-haulers which pick up loaded log cars from truck reload points. In most cases, these roads have been Dieselized. In a few cases, they have become mill-switching, lumber or freight lines.

The figures concerning mileage and numbers of locomotives are the highest of record, and do not necessarily indicate the extent of the operation for the last date given.

The dates represent the start and end of railroad operations, not necessarily the life of the parent company. Dates in parentheses are the earliest or latest of record.

Where a railroad operation was owned by another company, the owner is listed in parenthesis. Subsidiary and predecessor companies are listed in descending order below the parent or surviving organization.

Railroads having gauges less than the standard four feet, eight and-a-half inches are listed in bold-face type.

Abbreviations are as follows:

L—Lumber	M—Mill	g—geared
Lg—Logging	T—Timber	r—rod

CALIFORNIA

Name	Location	Mile- age	Locomo- tives	Dates
Albion L Co. (22)	Albion	30	2g 2r	(1902)-1934
Pacific Coast Redw L Co	Albion			-1920
Navarro L Co	Navarro	7	2g	1913-1920
Stearns L Co	Wendling	5	1g 1r	1905-1913
Albion & Southern RR	Albion	25	3	(1910)
Albion & Wetherbee Co	Albion	10		1880's
Albion River RR	Albion	7	1r	(1887, 1889)
Alpine L Co	Santa Clara	2	1r	1908-(1912)
Amer Fruit Growers Inc	Macdoel	8		1920-1922
Dwinneil L Co	Macdoel	8		1919-1920
Anderson & Middleton L Co	Bear Harbor	36		1902-(1904)
ARCATA & MAD RIVER RR (2)	Arcata	35	6	1902-present
(Simpson T Co)				1960-present
(Simpson Rdw Co)				1957-1960
(Northern Rdw Co)				1903-1957
(Humboldt L M Co)				1883-1903
Arcata Transportn Co				1881-1902
Union Plank Walk Rail Track Co (6)				1875-1881
Bear Harbor RR	Mendocino Cty			(1905)
Arcata M & L Co	Arcata	1	1	(1887, 1889)
Bendixen Shipbldg Co (23)	Eureka	2		(1908, 1910)
Birce & Smart (24)	Emigrant Gap	7	1g	(1905, 1910)
N J Blagen	Calpine			(1923)
Blue Lake Lg Co	Blue Lake			1928-1929
Bodie & Benton Ry	Bodie	40	4r	1881-1918
(Mono Lake L Co)				1908-1918
(Bodie Ry & L Co)				1856-1908
(Bodie & Benton Ry & Comm Co)				1882-1836
(Bodie Ry & L Co)				1881-1882
Brookings L & Box Co	Highland	10	2g	(1899)-1912
M A Burns Mfg Co	Eureka	20	2g	(1932)
Butte & Plumas Ry	Oroville	25	4	1902-1939
(Swayne L Co)				1917-1939
(Truckee L Co)				1902-1917
Oroville & Plumas Ry				
Calif Barrel Co	Arcata	6	1g	1916-1941
(Koster Products Co)				
Humboldt Cooperage Co	Arcata			1913-1918
Calif Door Co (25)	Diamond Spgs	12	3g	(1917)-1933
Calif Fruit Exchange	Graeagle	15	1r	1919-1937
Davies Box & L Co	Blairsden		1r	1916-1919
Calif Midland RR (16)	Burnells	4		1902-1903
Calif Peach & Fig Growers Assn	Mather	5	2g	1918-1926
Calif Tie & T Co	Pescadero	1	1	1929-1933
Calif T Co	Boulder Crk	7	1r	(1907, 1910)
Campbell Redw L Co	Pescadero			1917-1918
Canby RR Co	Canby	20	3g	1929-1948
(Ralph L Smith L Co)				1943-1948
(Big Lakes L & Box Co)				1937-1943
(Walker-Hovey Co)				1929-1937
Caspar L Co	Caspar	30	2g 5r	1876-1946
Caspar, South Fork & Eastern Ry	Caspar	14	4	1876-1946
Caspar & Hare Creek RR	Caspar	8	2	1884-(1889)
Castle Crag L Co	Castella	16	2g	1920-1936
M A Burns L Co	Castella	30	2g 1r	1911-1920
Chandler, Henderson & Co	Blue Lake	1		(1884)
Charles L Co	Boonville	8		1952-1957
Cleone L Co	Fort Bragg	1		
Clio L Co	Clio		1g	1907-(1914)
Clover Valley L Co	Loyalton	55	3g 1r	1917-1957
Marsh L Co (2)	Loyalton	7	1g 1r	1908-1920
Horton Bros	Loyalton	15	1r	(1902)-1908
Roberts L Co	Loyalton	5	1r	1900-1917
Boca & Loyalton RR	Loyalton	56	7	1902-1917
(Roberts L Co)				1915-1917
(Denver & Rio Grande RR)				1908-1915
Coggins Bros	Weed	6		1900-1905
Conklin Mill	Adin	10		1935-1940
John Cook	Hornbrook		1r	1892-1902
C A & Kenneth Copren	Loyalton		2	1950-1952
Coulterville L Co	Coulterville		1r	1948-1949
Crane Creek L Co	Willow Ranch	13	1g	1929-1934
Crown Willamette Paper Co	Truckee	15	1g	1920-1930
Davies-Johnson L Co	Calpine	15	1g 1r	1919-1936
A B Davis L Co	Jenner	2		1904-
Davis Creek L Co	Lookout	3		1931-1938
DeHaven L Co	DeHaven			-1901
DeHaven RR Co	DeHaven			(1917)
Diamond & Caldor Ry	Diamond Spgs	35	7	1904-1953
(Calif Door Co)				
Diamond Match Co (7)	Stirling City	50	4g 3r	1902-1953
Butte County RR Co (27)	Chico	32	4	1903-1913
Yellow Jacket RR	Lyonsville	10		1908-1913
Kimshew RR	Stirling City	25	3	(1910, 1912)
E J Dodge L Co	Newburg	8	3r	1914-1930
Eel River Valley L Co	Fortuna	7	3r	1891-1914
Dougherty L Co	Boulder Crk		1r	-1888
Duncan Mills (Land &) L Co	Duncan Mills	5	1r	(1880)-1903
J N Durney L Co	Weed	4	1g 1r	(1907, 1912)
Eel River & Eureka RR Co	Eureka	30	3r	1884-1903
Calif & Northern RR	Eureka	9		1901-1903
Elk Redw Co	Elk	12	2g	1934-1938
Feather River L Co	Portola	30	3g	(1915)-1943
Feather River Pine Mills	Feather Fls	40	4g 1r	1927-1950
Hutchinson L Co	Oroville	40	4g 1r	1922-1927
FEATHER RIVER RY (Georgia-Pacific Corp) (Feather River Pine Mills) (Hutchinson L Co)	Feather Fls	32	5	1923-present 1955-present 1927-1955 1927-1955
Fibreboard Corp	Hobart Mills	7		1923-1927
Finkbine-Guild Co	Rockport		2	1926-1931
New York & Penn Redw Co	Hardy	5	2g	1907-1911
C A Hooper & Co	Hardy	3	2g	(1886)-1907
Hardy Crk & Eel Riv RR (28)		5	1	1907-(1912)
Ft Bragg & Southeastern RR	Albion	15		1903-1907
Albion & Southeastern RR	Albion			1902-1903
Ft Ross L Co	Ft Ross	1		(1910)
Forward Bros L Co	Manton	3		(1941)
Chas H Fowler & Co	Grass Valley	2		(1910)
Fruit Growers Supply Co	Hilt	50	4g	1913-1953
	Susanville	35	3r	1921-1953
M C Gardner	Cp Richrdsn	40	2r	1875-1885
GEORGIA-PACIFIC CORP	Samoa	31	2g 4r	1956-present
Hammond Redw L Co	Samoa	48	13	1936-1956
Humboldt Redw Co	Carlotta	5	2g 1r	1929-1937
Bayside Redw Co	Eureka	5	2g 1r	1920-1929
Bayside L Co	Eureka	9	2g	1900-1920
Hammond & Little River Redw Co	Crannell	80	4g 3r	1931-1936
Little River Redw Co	Crannell	18	4g 2r	1908-1931
Hammond L Co	Samoa	30	3g 3r	1912-1931
Vance Redw L Co	Samoa	20	1r	1900-1912
John Vance M & L Co	Samoa	7	1r	1886-1900
Oregon & Eureka RR (29)	Eureka	47	9	1903-1911
Eureka & Klamath Riv RR		35	6	1896-1903
Humboldt Bay & Trinidad RR	Vance	13		1892-1896
Humboldt Bay & Trinidad Lg & L Co				1891-1892
Humboldt & Mad River RR	Vance	12	3r	1875-1891
Humboldt Northern Ry (Hammond interests)	Samoa	20	2r	1905-1958
(Little River Rdw Co)				1931-1956
(Dolbeer & Carson L Co Carson Ry Co)				1925-1931 1905-1925
Glynn & Peterson M & L Co	Del Mar	3	1r	(1907, 1910)
Goodyear Redw Co	Elk	40	3g 1r	1916-1935
L E White L Co	Elk	22	2g 3r	(1887)-1916
Salmon Creek RR	Whitesboro	10	2r	(1884, 1889)
Greenwood RR Co	Greenwood	16		1890-(1908)
Elk Creek RR	Elk	25	2g 3r	1889-(1912)
Mendocino RR	Greenwood	4	2r	1876-(1888)
Graeagle L Co	Blairsden			(1916)
Grizzly Creek L Co	Castella	1	1g	1921
Gualala River RR Co	Cazadero	15	1r	1891-(1908)
Hassler L Co	Hobart Mills	7		1950-1951
A Haun & Sons	Branscomb	1	1r	(1908)-1924
Helm L Co	Laytonville	1	1	(1941)
J C Hickman & Son	Annapolis	2		(1910, 1912)
F A Hihn	Loma Prieta			(1880's)
Hobart (Estate) Mills (7)	Hobart Mills	32	3g 2r	1918-1936
Sierra New Wood & L Co	Hobart Mills	28	1g 7r	1896-1918
Hobart Southern RR	Hobart Mills	7		1930-1935
Hobbs, Wall & Co	Crescent City	20	1g 6r	(1887)-1940
Del Norte Southern RR	Crescent City	8	1g 6r	1912-1925
Crescent City & Smith River RR	Crescent City	17	4r	(1907)-1912
Holmes-Eureka L Co	Carlotta	8	2g 2r	(1905)-1949
Howard Creek L Co	Westport	2	1r	(1906)
Indian Valley RR (30)	Greenville	22	2r	1917-1938
Jacoby Creek RR (31)	Eureka	7	2r	(1887, 1889)
Johnson-Follock L Co	Macdoel	6	1g	(1915)-1919
Kaweah & Giant Forest RR	Three Rivers	2	1r	1888-1890
Kesterson L Co	Dorris	15	1g	(1926)-1930
Kespine L Co	Dorris	7	1g	(1922)
Klamath-Calif Redw Co	Klamath	1		1935-1938
Klamath Lake RR Co (32)	Copco	30	2r	1903-1913
(Weyerhaeuser T Co)				
Oregon Southern RR				
Knob Peak L Co	Placerville	10		(1951)
Lk Tahoe Ry & Transpntn Co (Truckee L Co) (10)	Truckee	18	4	1899-1926
Lake Valley RR	Bljou	14	2r	1886-1898
G W Chubbuck	Bljou	4	1r	1884-1886
Lamoline L & Trading Co	Lamoline	22	2g	1898-1922
Lassen L & Box Co	Susanville	18	1g 3r	1918-1938
Lassen Lg Co	Susanville	2	1g	1918-1921
Laton L & Investment Co	Markham	3		1906-(1910)
Markham L Co	Markham	4	2g	(1887)-1903
Liberty L Co	Duncans Mills	1		1920-1923
Loma Prieta L Co	Aptos	5	2g 1r	1911-1926
Long-Bell L Co	Weed	60	1g 7r	1926-1956
Weed L Co (33)	Weed	50	6r	1903-1926
Calif & Northeastern RR (34)	Weed RR Co	31	2r	1904-(1908)
Loyalton L Co	Loyalton			1900-
Madera Sugar Pine L Co	Madera	32	4g 1r	1899-1935
Madera Flume & Tradg Co	Madera		1g	1892-1899
Madrona Land & L Co	Sonoma Cnty	1		(1877)
Massack T & L Co	Sprg Garden	3	1g	(1917)-1921
Mattole L Co	Petrolia	4	1r	1908-1923
McCLOUD RIVER L CO	McCloud	60	4	1902-present
McCLOUD RIVER RR CO	McCloud	100	15r	1897-present
(McCloud River L Co)				1905-present
(Scott & VanArsdale Co)				1897-1905
McCormack & Hauptman	Fieldbrook	1		1902-
McKay & Co	Eureka	10	2r	(1891)-1934
Occidental M Co				

Name	Location	Mile- age	Locomo- tives	Dates	Name	Location	Mile- age	Locomo- tives	Dates
McKay L Co	McKay	5			M J Scanlon L Co	Massack	6	2g	1923-1926
Metropolitan Redw Co	Metropolitan	4			Geo Schafer	Truckee		1r	(1889)
Michigan-Calif L Co	Camino	50	7g 1r	1907-1929	T R Shannon	Carlotta	4	1	1940-(1942)
Calif (36)				1917-1949	Shasta Commercial Co	Terry Mills	10	3r	(1917)-1919
R E Danaher Co	Camino	15	10g 2r	1915-1917	Shasta L Co			1r	(1891)
C D Danaher Pine Co	Camino		3g 3r	1911-1915	Shaver Lake L Co	Shaver	12	2g	1919-1927
El Dorado L Co	Camino	34	7g 1r	1900-1911	Fresno Flume & L Co	Shaver	12	2g	(1907)-1919
American River	Folsom		1g 1r	1892-1900	Shaver Lake RR	Shaver	6	1g	(1907)-1919
Land & L Co					J G Shebley	Colfax	6	1g	(1908)
Minor M & L Co	Glendale	2	1g 1r	1903-1913	Sierra L Co	Lyonsville	22	4r	1881-1907
Isaac Minor	Glendale	2		1885-1903	Sierraville L Co	Sierra City	13		1952-1954
	Warren Creek	1		(1883)-1885	Siskiyou L Co	Mt. Hebron	12	1g	1920-1930
Warren Creek RR	Warren Creek	2	1	(1887, 1889)	Sisson M & L Co	Sisson	3	1	1889-
Warren Creek RR Co (35)	Warren Creek	2	1g	1913-1914	Sonoma L Co			1	1892-1902
Granite Mtn Rock					Guerne-Murphy L Co	Guerneville		1r	1886-1892
Quarry RR	Warren Creek				Heald & Guerne L Co	Guerneville	3	1r	1877-1886
Minton Mills	Duncan Mills	4	1g	1912-1913	South Bay RR & Land Co	Eureka	13	1r	1875-(1884)
Molino T Co	Loma Prieta		1r	1919-1922 *	Southern Humboldt L Co (9)	Andersonia	17	1g 1r	1905-1940
The Moon L Co	Hilt	3	1g 1r	1890's	Southern Oregon L Co	Siskiyou	7		1928-1929
Mt Hebron L Co	Macdoel	6	1r	1921-1923	Spanish Peak L Co (2)	Quincy	7	2	1926-1935
Mt Shasta Pine Mfg Co	Mt Shasta	7	1g 1r	1918-1926	Standard L Co	Standard	60	8g	(1907)-1926
Pioneer Box & L Co	Mt Shasta	3	1r	1928-1936		Macdoel	7	1g	1923-1926
Pioneer Box Co	Mt Shasta	9	1r	1923-1928	Empire City RR	Sonora	16	7	1910-1917
National Redw Co	Gualala	23	2r	(1917)-1923	Stanislaus Ry	Sonora	16	3g	1907-1910
American Redw Co	Gualala	22	2r	1920-1923	(Union Constr Co)				
Empire Redw Co	Gualala	18	4r	1915-1920	Sugar Pine L Co	Pinedale	35	1g 5r	1923-1935
Gualala M Co	Gualala	17	3r	1903-1915	Minarets & Western RR	Pinedale	65	5r	1923-1933
Navarro M & RR Co	Navarro	10	3r	1872-1903	Swayne L Co	Oroville	50	6g 2r	1900-1940
Geo H Newell, Inc	Scotia	1		(1886, 1890)	F M Thatcher	Stirling City	14	2g 2r	(1917)-1923
Newhart L & M Co	Willits	1	1g	(1908, 1910)	Towle Bros	Truckee	20	1r	(1883, 1890)
Nibley-Stoddard L Co	Cromberg	10	2g	1923-1926	Truckee L Co	Truckee	10	2r	1886-1917
Nine L Co (7)	Bray	8	2r	1922-1936					1883
North Coast L Co	Ft Bragg	2	1g	(1916)-1919	Pacific L & Wood Co	Truckee	6	2r	(1887)-1902
North Pacific Coast RR	Sausalito	88	12	(1914)-1916	Union L Co	Ft Bragg	27	1g	1891-1949
Northwestern RR of	Duncan Mills	7		1874-1902	The Mendocino L Co	Mendocino	15	1g 2r	1895-1938
Northern Calif L Co	Hilt	10	3g	1886-1902	Mendocino L Co	Mendocino	6	2	(1901)-1905
Northern Redw L Co (7)	Korbel	20	4g 2r	1907-(1911)	Glen Blair Redw Co	Glen Blair	10	2g 1r	1903-1928
Riverside M & L Co	Eureka	8	1r	1903-1956	Pudding Creek L Co	Glen Blair	5		1886-1903
Humboldt L M Co	Korbel	26	1r	1889-1903	Ft Bragg Redw Co	Ft Bragg		1	1885-1891
Northwestern Redw Co	Willits	16	4	1883-1903	CALIFORNIA WESTERN	Ft Bragg	50	6	1905-present
Irvine & Muir L Co	Willits	13	2r	1901-1928	RR				
Oak Valley L Co	Comptonville	7		(1906)-1928	Ft Bragg RR Co	Ft Bragg	18		1885-1905
THE PACIFIC L CO	Scotia	35	2g 7r	1920-	(Ft Bragg Redw Co)				
Humboldt Bay &	Eureka	7		1886-present	Noyo & Pudding	Noyo		3	1881-1885
Eureka RR				1884-	Crk RR (McPherson				
Eureka & Freshwater Ry	Eureka	2	1	1900-(1914)	& Weatherby)				
Dolbeer & Carson L Co	Eureka	20	2g	1882-1950	Usal Redw Co	Rockport	6	1g	1890-1902
Bcksprt & Elk River RR	Bucksport	15	2	1886-1950	M S Waxy	Cazadero	4	1	1909-(1910)
Freshwater L Co	Eureka		2r	1902-1904	D H McEwen L Co	Cazadero	6	1g	1906-1909
Excelsior Redw Co	Eureka	15	2r	(1891)-1902	Cazadero L Co	Cazadero			-1906
Elk River M & L Co	Falk	5	1g 2r	1885-1937	Wells L Co	Rio Dell	5		1953-1954
Calif Redwood Co	Trinidad	10		1885-1937	Western Redw L Co	Jenner	8	1r	(1907)-1910
Humboldt Lg Ry	Freshwater	15	4	1883-1901	Westport L & RR Co	Jenner	5	1r	(1907)-1910
Trinidad M Co	Trinidad	5	1r	1880-1883	Calif L Co (1)	Westport		2r	(1908)-1908
Smith & Dougherty	Trinidad	4		1875-1883	Wood & Sheldon L Co	Sisson	9	1r	(1903, 1912)
Hooper Bros	Trinidad		1r	1871-1875	Yosemite Valley RR	Merced	79	5r	1907-1945
				-1875	Yosemite Sugar Pine L Co	Merced Fls	22	5	1934-1942
Peppers-Cotton L Co	Macdoel	12		1921-	Yosemite L Co	Merced Fls	40	4g 2r	1910-1938
PICKERING L CORP	Standard	100	10g	1898-present	YREKA WESTERN RR Co	Yreka	8	3	1933-present
WEST SIDE L CO (37)	Tuolumne	80	10g	1900-1925	Yreka RR Co (2)	Yreka	8	2r	1889-1933
Hetch Hetchy &	Tuolumne	35	8	1900-1925					
Yosemite Valley RR									
Sugar Pine Ry Co	Standard	24	5	1903-1920					
(Standard L Co)									
Pine Ridge L Co	Tollhouse	2	1g	(1908, 1910)					
Pollard & Dodge	Newberg	2		(1901)					
Pollard L Co	Westport	3	1g	(1907)-1919	Name	Location	Mile- age	Locomo- tives	Dates
Quincy L Co	Quincy	24	2g	1926-1955	Addison-Hill L Co	Tacoma	5		(1912)
F S Murphy L Co	Quincy	6	1g 1r	1918-1926	Admiralty Lg Co	Edmonds	23	4g	1916-1922
Quincy L Co	Quincy	3		1918-1918		Kenmore	4	1g	
Quincy L Co	Sloat	4	1g	1926-1936	Brown's Bay Lg Co	Meadowdale	14	2g	1906-1916
F S Murphy L Co	Sloat	6	1g 1r	1918-1926	Adna L Co	Adna	2		(1909, 1913)
Sloat L Co	Sloat	3	1g 1r	1917-1918	Adna M Co	Adna	3	1g	(1904, 1911)
QUINCY RR Co	Quincy	6	2	1917-present	Advance L Co	White Salmon			1913-1916
(Meadow Valley L Co)		6	2	1956-present	Agnew L Co	Centralia	7	2	1951-1958
(Quincy L Co)		16		1926-1956	Alger Lg Co	Skamokawa	7	1g 1r	1903-1933
(F S Murphy L Co)		14		1917-1926	Allen & Nelson M Co	Monohan	4	1g	(1910)-1922
Quincy Western Ry Co		8	1r	1910-1917	Allen & Nolte Lg Co	Glacier	4	1g 1r	1923-1926
Rainbow M & L Co	Sisson	12	1	(1919)-1921	Glacier RR	Glacier			1922-1923
N B Randal Sawmill	Fiddletown	20		1935-1938	Allen & Sons				(1907)
Read T & L Co	Emigrant Gap	30	6r	(1907)-1918	H F Allison	Parkland	1		1908-(1913)
Red River L Co	Westwood	95	4g 9r	1912-1947	Aloha L Co	Aloha	25	2g 2r	(1917)-1940
Red River RR (8)	Westwood	17	3	1926-1947	American L Co	Sumas	5		(1912)-1915
Terry L Co	Anderson	12	5g 2r	(1906)-1918	American M Co	Montesano			1902-
Calif Shasta & Estn (38)	Anderson	28	1	1913-1927	American T Co	Brinnon	6	1g	1931-1936
Anderson & Bella	Anderson	16	3	(1910)-1913	Anderson & Middleton	Oakville	7		1906-1916
Vista RR						North River	4	1g	1916-1929
Redw L Co	Ft Ross	1		1911-(1912)		Aberdeen	2	2g	1908-1912
Ft Ross L Co	Ft Ross	1		(1910)-1911	Union M (T) Co	Aberdeen	7	1g	1929-1936
Redw Mfg Co	Black Diamond	13		(1910)	H N Anderson Lg Co	Mayfield	10	3g	1923-1941
Redwood RR	Mendocino Cty			(1884)	Andron Lg Co	Darrington	5	2g	1928-
L C Reynolds	Shingletown			-1906		Ceres	3	1g	1923-1926
M & G W Richardson	Truckee	3	1	(1887, 1889)	Apex Lg Co	Auburn	3		1911-(1913)
Rockport Redw Co	Rockport			1938-(1939)	B & B Lg Co	Redmond	6	1g	1922-1927
Southern Redw Corp	Rockport			1928-1938	B-M Lg Co	Sedro-Woolley	3		1938-1940
Finkbine-Guild	Rockport			-1928	Backus Lg Co	Bellingham			(1929)
SF & N Pacific RR (22) (26)	Ukiah	94	8	1872-1889	Badger L Co	Tenino	3	1g	(1917)-1919
Fulton & Guerneville RR	Fulton	16		1876-1887	Baker-May L Co	Dryad	2	1r	1909-1915
San Vincente M & L Co	Santa Cruz	10	2g 1r	1908-1923	Baker River & Shuksan RR	Concrete	3	3	1908-1918
Sanderson & Porter	Sonora	16	3g	1910	Baldridge Lg Co	Stevenson	5	2g	1927-1931
Sanger L Co	Sanger	40	3g	1885-1930		Hobart	6	2g	1934-1941
Hume-Bennett L Co (2)					Wood & Iverson	Hobart	17	3g	1912-1934
Sanger L Co						Snohomish	5	2g	1903-1912
Kings River L Co					H A Baldwin	Vader	3	1g	1917-1919
Moore & Smith					Stillwater L Co	Vader	3	2g	(1907)-1917
Sequoia RR			1g	(1896)	Ballard L Co	Bay View	6	1g	1885-(1910)
Santa Clara Val M & L					N Ballhorn	Woodland	2		1942-1947
Co (1)	Boulder Crk	7	1r	(1887)-1920	Barker Lg Co	Lake Whatcom			1920-1927
Santa Cruz L Co	Boulder Crk	6	1r	1930-1955					

Name	Location	Mile- age	Locomo- tives	Dates	Name	Location	Mile- age	Locomo- tives	Dates
A W Barker	Allyn	9	1g	1908-(1911)	Chappell L Co	Granite Falls	1		(1910)
Barnard & Barnard	Skamokawa		1g	1909-	Chehalis L Co	Littell	8	2	1902-(1913)
Bay Lg Co	Raymond		1g		Chehalis M Co	Salkum	10	1g	1916-1940
Beaver Creek L Co	Rochester	3	1r	1918-1925	Chehalis River Lg Co	Independence	2	1g	1923-1926
Beck Bros Lg Co	Quilcene	4	2g	1912-1919	Chehalis River L & Shingle Co	Centralia	5	2g	1902-1914
S J Beck Lg Co	Lexington	3	2g	(1907, 1910)	CHEHALIS WESTERN RR	Chehalis	57	2	1936-present
R C Bell	Skamokawa	3	1r	1917-1918	(Weyerhaeuser Co)				
Bell Lg Co	Deep River		1g	1906-(1915)	Cherry Valley Lg Co	Monroe	45	4g 2r	1902-1930
Bellingham Bay & British Columbia RR (20)	Bellingham	58	8	1888-1912	(Weyerhaeuser T Co)				
(Bloedel-Donovan L Ms)					Chicago L & Coal Co	Maple Falls	4		1913-1916
(Bellingh Bay Impvmt Co)					Chinn (Bros) T Co	Maple Falls	8	2g	1902-1926
(Bellingh Bay Coal Co)					Chinook L & Mfg Co	Republic	40	3g	(1931)
Bellingham Bay & Eastern RR (12)	Bellingham	19	2	1892-1902	Chittenden Land Co	King Cnty	12	2g	1910-(1913)
Bellingham Eastern Lg & Ry Co	Wickersham	9		1910-1912	Cispus Lg Co	Port Orchard	12	2g	1926-1934
Bellingham T & L Co	Bellingham	4	1r	(1907, 1910)	Clark County T Co	Yacolt	30	3g 1r	1917-1924
F A Bennett	Klickitat		1g	1917-1919	(Weyerhaeuser T Co)				
Bennett Lg Co	Monohan	6	1g	1907-(1913)	Twin Falls Lg Co	Yacolt	30	2g 3r	1903-1917
Frank Betchart	Roy	8	1g	1916-1947	Clark Creek Lg Co	Kelso	4	1g 2r	1902-1913
Big Fir Lg Co	Darrington	2		1917-1927	Clear Lake L Co	Clear Lake	55	6g 1r	1903-1927
Big Four L Co	Whatcom Cnty	2	1r	(1907)-1909	Bratnobar-Waite L Co	Clear Lake		2g	(1900)-1903
Biles-Coleman L Co	Omak	45	2g	1922-1948	Kennedy & O'Brien	Clear Lake			-1902
J C Biles	Montesano	1	1g	1902-	Skagit Lg Co	Clear Lake	3	1g	1911-1915
Bingman Co	Morton	5		1944-1946	Climax Lg Co	Aberdeen	2	1g	(1917)-1919
Bismark M Co	Tacoma	3	1	1910-(1913)	(Aberdeen L & Sh Co)				
Black Lake & Sherman Valley RR	Olympia	3	1	1880-(1890)	Climax Shingle Co	Blaine	4	1g	1908-1914
Black Lake L Co	Olympia	1	1g	(1908)	Climax T Co	Maple Falls	5	1g	1918-1919
Black River Junction & Franklin RR	Renton	24		(1892)	Cline & Taylor (3)	Chehalis		1	(1899, 1900)
Blackman Bros L Co	Marysville	4	1g	(1881, 1891)	Clipper Shingle Co	Clippier	6	1g 2r	(1917)-1918
Blanchard & Alger	Blanchard	5		1890-	Coal Creek L Co	Chehalis	10	2g	1905-1929
Blanchard RR	Blanchard	6	6	(1887)-1890	Harm & Brown L Co	Tenino	1	1g	1908-1912
Bloedel-Donovan L Mills	Bellingham	140	2g 3r	1913-1946	Coal Creek RR Co	Chehalis		1	1903-(1905)
Lake Whatcom Lg Co	Bellingham	30	2g 1r	1900-1913	Cobb & Hawley	Everett	6		1907-
Larson Co	Bellingham	15		1912-1913	Cogshall & Metsker L Co	Sedro-Woolley	1		(1907, 1912)
C A Bloomfield	South Prairie	3	2g	1908-1912	Cole Shingle Co	South Bend		1g	(1907)
Bocek & White	Hoquiam	2	1r	1918-1919	Colling & Byerly	Kelso		1	(1906)
Bolcom-Vanderhoof Lg Co	Standard	10	2g	1908-1918	COLUMBIA & COWLITZ RY CO	Longview	15	2	1929-present
Bolcom-Riley Lg Co	Port Townsend	3	1g	-1908	(Weyerhaeuser Co)				
Boulder Ry & T Co	Hazel	8	3g	(1910)	Columbia & Washington Ry Co	Vancouver		1r	(1897, 1901)
Bradford-Kennedy L Co	Newman Lake			1912-	Columbia Lg Co	Grays River	5	1g	(1912)-1918
Brew Mfg Co	Puyallup	10	1g	1918-1941	Columbia River & Grays Harbor RR Co	Oak Point	4	1r	1883-1891
Bridges & Floyd (4)	McNeil Isld	3	1	(1917)-1921	Columbia River Lg & T Co	Alger Creek	4		(1913, 1917)
A H Brix L Co	Rainier	8	1g 1r	1922-1923	Columbia River L Co	Vancouver			(1902)-1904
Clear Lake Lg Co	Rainier	6	1g	1915-1922	Columbia River T Co	Vancouver	12	2g 2r	1928-1934
(A P Perry L Co)					Columbia Tie & T Co	Yacolt	1	1g	1906-1921
Brix Lg Co	Knappton	20	5	1935-1938	Columbia Valley L Co	Skykomish	4	1g	1917-1919
Knappton Ms & L Co (1)	Knappton			(1922)-1935	(Bloedel-Donovan L Ms)				
(Brix Bros Lg Co)					Skykomish L Co	Skykomish	7	1g	(1906)-1917
Brix Bros Lg Co	Knappton	10	3g	1913-1926	Connacher Lg Co	Stevenson	8		1927-
Astoria T & L Co	Knappton	6	4g	1909-1913	Cougar L & Shingle Co	Bellingham	5	1r	1908-1912
Grays Bay Lg Co	Knappton	6	2g	1899-1909	Sam Coulter	Snohomish	3		1893-
(Brix Lg Co)						Mason Cnty	2		(1892)
S Broe	Everett	1	1	1919	Courtney L Co	Robe	3	1	(1940, 1941)
Broughton & Wiggins		1		(1913)	Covington L Co	Kent	12	2	(1906, 1913)
Broughton L Co	Willard	8	3	1928-1941	Cowden L Co	Sauk	2	1g	1920-1923
Buffelen L & Mfg Co	Deming	14	4g	1922-1939	Cowlitz, Chehalis & Cascade Ry (48)	Chehalis	39	3r	1916-1955
	Eagle Gorge	12	1g 1r	1922-1930	Chehalis & Cowlitz RR	Chehalis	10		1913-1916
	Eagle Gorge	9	1g 1r	1901-1922	(Washington Electric Ry Co)				
Page L Co	Colville	22		1906-	Twin City RR Co	Centralia	4		1910-1929
Burke & Lane L Co	Belfast	2	1g	1906-1918	Craig Lg Co	Ilwaco			1900-
Butler L Co	Bellingham			1926-1928	Creech Bros L Co	Raymond	4	1g	1908-1913
Byles Lg Co	Brinnon	6	1g	1925-1932	Crocker Lake Lg Co	Quilcene	4	2g	1918-1920
C B & M Lg Co	Easton	12	2g	1918-1940	Crown Zellerbach Corp	Cathlamet	60	3g 3r	1928-1958
Cabin Creek L Co	Thornwood	3	1g	(1907)-1909	Crown Willamette Paper	Cathlamet	16	5g 1r	1927-1928
D J Cain & Co	Deming	5	1g	1910-1915	Cathlamet T Co	Cathlamet	14	3g	(1902)-1923
Cain L Co	Kapowsin	4		1911-(1913)	(Portland L Co)				
Calpenham L Co	Camano	4	1g	1908-(1910)	Bradley Lg Co	Cathlamet	8	3g	1908-1923
Camano Commercial Co	Deep River	8	2g	1908-1916	Armstrong-Pelton Lg Co		2	1g	1901-1908
Campbell L Co	Deep River	4	1g	1906-1908	Fibreboard Products (49)	Port Angeles	30	3	1927-1946
Chinook L Co	Redmond	16	3	(1906)-1926	Crescent Lg Co	Port Angeles	22	4g	1927-1946
Campbell (Bros) L Co	Charleston Bay	1	1g 1r	1926-1931	Irving-Hartley Lg Co	Port Angeles	6	2g	1924-1927
Campbell M Co	Hoodspout	6	2g	1901-1930	Carlsborg M & T Co	Carlsborg	30	2g 1r	1916-1942
Canal Lg Co (1)	Robe	3	1g	1905-1912	Izett L Co	Brinnon	6	2g	1904-1916
Canyon L Co	Prindle	20	2g	1908-1914	Washington Pulp & Paper	Neah Bay	25	3g	1934-1942
Cape Horn RR Co					Cumberland Mills Co		1		(1912)
(Ore & Wash Lg Co)					Dabob Bay Lg Co	Dabob	2	1	1910-(1913)
Carlisle L Co	Onalaska	30	3g 4r	1924-1943	Dalkena L Co	Dalkena	12	1g	1923-1936
Carlisle-Pennell L Co	Onalaska	10	2g	1914-1924	Damon & Minard Co	Elma	6		(1912, 1914)
Onalaska L Co	Onalaska	6	3g	1916-1917	Danaher L Co	Darrington	18	2g	1910-1923
Newaukum Valley RR Co	Onalaska	11	1g 1r	1915-1943		Port Orchard			
Copalis L Co	Carlisle	9	1g 2r	1914-1920	Davidson Lg Co	Darrington	1		(1942)
Carlson (Bros) Lg Co	Aberdeen	1		1902-(1915)	Day Creek L Co	Lyman	4	1g	1907-(1910)
Carlson L Co	Mineral	4	1g	1923-1930	Day L Co	Big Lake	12	3g	1906-1926
Cascade L Co	Yakima	42	4g 2r	1908-1954	Deep River Lg Co	Deep River	20	2g 3r	1900-1955
North Yakima & Valley RR (12)	Yakima	40	3	1905-(1914)	Deer Park L Co	Deer Park	52	3g 2r	1914-1956
Cascade T Co	Reliance	30	3g 4r	(1903)-1942	Standard L Co	Deer Park	5		1913-1914
Case Shingle & T Co (1)	Raymond	2	2	1905-1938	Deer Park Central Ry	Deer Park	25		1920-1936
D Cavalero	Gig Harbor	4		(1913)	Springdale & Long Lake RR	Springdale	20		1911-1920
Gig Harbor T Co	Gig Harbor	4	2	1908-(1910)	(Wash Water Power Co)				
Cavano Lg Co	Arlington	6	2g	1921-1927	Defiance L Co	Buckley	8	1g	(1906)-1919
Cedar Creek Lg Co	Toledo	15	3g	1926-1929	Dempsey L Co	Hamilton	30	2g 1r	1907-1929
Cedar Lake Lg Co	Cedar Falls	6	2g	1913-1919	Denhart L Co	Kapowsin	15	3g	1918-1945
Cedarhome L Co	Stanwood	3	1g	1907-1921	Dickey & Angel Lg Co	Darrington	2		(1918)
Cedar River M Co	Maple Valley	3	1r	1908-(1914)	Dickey & Wood Lg Co	Machias	4	2g	(1906)-1912
Central Lg Co	Whatcom Cnty	3		(1909)-1916	Henry Dickinson L Co	Startup	2		1929-1931
Central L Co	Napavine			(1906)	Great Northern M Co	Stanwood	2	1	1910-1912
Central M Co	Tacoma	2		1911-(1913)	Dickson-Tobey Lg Co	Stanwood	2	1	1908-1910
Centralia Eastern RR & L Co (12)	Centralia	10		1907-(1916)	Discovery Bay Lg Co	Chehalis			1909-(1913)
Chambers Lg Co	South Bend	3	1g	1916-1919		Uncas	11	3g	(1917)-1926
Kleebe L Co	South Bend	2	1g	1910-1916					
Chandler Bros	Frances	1	1r	1904-1908					
Chapman Lg Co	Stella			1901-(1906)					
Weist Bros	Stella	1		(1899)-1901					

Name	Location	Mile- age	Locomo- tives	Dates	Name	Location	Mile- age	Locomo- tives	Dates
Dittman L Co	Napavine	3	1r	1909-1916	Gold Bar L Co	Gold Bar	10	2g 1r	(1905)-1917
Dittman & Springstein	Napavine	1	1r	(1907)-1909	Goodro Lg Co	Shelton	5	1g	1920-1926
Donovan-Corkery Lg Co	Aberdeen	50	4g 1r	1923-1934	Gorman & Lawson	Ridgefield	7	2r	(1907, 1910)
Coates-Fordney Lg Co	Aberdeen	15	3g	1910-1923	Goshen L Co	Bellingham	2	1g	(1917)-1923
Coates (Bros) Lg Co	Aberdeen	7	3g	1905-1910	Grace M Co	Bothell		1g	(1909)
Donovan-Dubois L Co	Stevenson	4	1g	1919-1926	Graham Bros	Bucoda			1915-
Fir L Mfg Co	Stevenson	3		1918-1919	Great Northern L Co	Leavenworth	30	3g	1916-1926
Dosewallips T Co	Brinnon	1		1908-(1910)	Lamb-Davis L Co	Leavenworth	18	1g	1909-1916
Doty L & Shingle Co	Doty	12	3g 1r	1904-1929	Wenatchee Valley & Northern Ry	Leavenworth	30	1g 1r	1907-1916
Doty L Co	Doty	11	1g	1902-1904	Green Cedar Shingle Co	Elma			1907-
Doty & Stoddard L Co	Doty			1900-1902	Green River L Co	Baldi	6	2g	1918-1928
Elk Creek & Grays Harbor Ry	Doty	11		1913-1916		McIntosh	8	2g 1r	1923-1928
Doud Bros L Co	Buckley	2	1r	1903-1908	Greenwood Lg Co	Aberdeen	22	3g	1922-1938
Dry Creek Lg Co	Monroe	7	2g	1926-1929	Griffin Transportation Co	Tacoma	1		1908-(1913)
Dubois L Co	Woodland	4	1g	1911-1926	Groening Stiles T Co	Port Orchard	5	1g	1908-(1910)
Duncan L Co	Napavine	6		1918-1919	Gruber & Docherty L Co	Yelm	5	1g	1919-1938
Dungeness T Co	Carlsborg	12	2	1936-1938	I B Grungstad	Skamokawa	3	1g	1918-1919
Eagle Falls Lg Co	Index	5	1g	1925-1926	J P Guerrier L Co	Napavine	2	1g	(1917)-1923
Eagle Gorge Lg Co	Eagle Gorge	8	2g	1947-1955	H B & A Lg Co	Grays River	9	2g	1910-1923
Buckley Lg Co	Eagle Gorge	22	2g 1r	1919-1947	H J & M Lg Co	Granite Falls	2		1931-1933
Eagle M Co	Centralia	1	1g	1908-1912	H L & S Co	Hoquiam	6	2	(1918)
Eastern & Western L Co (2)	Eufaula	13	3g 2r	1902-1927	J M Hackett Lg Co	Carlisle	2		(1916)-1918
Western L Co	Eufaula			1895-1902	Hall & Bishop	Port Crescent	3	1g	(1904)-1910
B F Brock Lg Co	Eufaula		1g 1r	1883-1902	Hall & Rowland	Amboy	30		1953-1957
Mosquito & Coal Crk RR (B F Brock)	Eufaula	3	1r	1883-1904	Henry Hall	Onalaska	8	2r	1921-1924
Eufaula Co	Eufaula	24	3g 2r	1915-1927	J W Hall	Stanwood	1	1	(1907, 1913)
Eastern Ry & L Co	Centralia	16	4g 1r	1903-1940	Hall's Lake M Co	Snohomish	2		(1913)
Tacoma, Olympia & Chehalis Valley RR	Centralia	10	2	1910-1914	Halley & Alger	Skagit Cnty		1	1890-(1892)
Eatonville L Co	Eatonville	20	3g	1908-1940	Haltermann Lg Co	Oso		1g	1905-(1909)
Ebey Lg Co	Arlington	30	'5g 1r	1908-1927	Hamilton Lg Co	Hamilton		3g	1907-1923
Eclipse M Co	Everett	11		1911-(1915)	Lyman Pass RR	Hamilton			1916-
Eclipse Shingle Co	Blairstown	3	1g	(1907, 1910)	Hamma Hamma Lg Co	Bremerton	15	4r	1922-1933
Edgcomb M Co	Arlington	2	1	(1910)	L Hammerschmith & Sons	Yelm	5	1g	1926-1932
Edlund Lg Co	Goldbar	23	3r	1938-1940	Hammond L Co	Kelso	15	3g	1908-1929
Edmonds & Eastern RR	Edmonds	5		(1910)	Harbor Lg Co	Whidbey Isl	2	1r	1906-1908
J W Edwards	Lynden	5	1r	(1910, 1911)	Harbor Plywood Corp	National	15	2r	1945-1957
Eiswerth Bishop Lg Co	Fairfax	6	1g	1917-1923	Harding L Co	Tacoma	7	1g	1909-1922
Elbe L & Shingle Co	Elbe	10	1g	1908-1936	Wheeler-Reese L Co	Tacoma	7	1g	1909-1920
Electric Lg Co	Tacoma	8	1g	(1907, 1913)	Harstad L Co	Yelm	6	1g 1r	1922-1935
Ellis Bros	Raymond	2		1906-1908	Hart-Wood L Co	Raymond	8		1919-
Elma L Co	Elma	3	1g	1907-(1915)	(Spruce Prod Div #V)				
Emery & Nelson L Co	Napavine	12	2g	1909-1927	Hartford Eastern Ry	Hartford	42	1	1915-1933
Empire T Co	Anacortes	2		1913-	(Puget Sound Pulp & T Co)				1929-1933
J H England L Co	Winlock	1	1	1926-1929	(Rucker Bros Co)				1925-1929
English L Co	Mt Vernon	70	7g 1r	1901-1946	(NP lease to Ruckers)				1915-1925
Parker-Bell L Co	Bryant	15	2g	(1905)-1922	Monte Cristo Ry Co		42		1900-1915
Parker Bros & Co	Bryant		1g	(1901)	(NPRR)				
Erickson & Furnham	Rockport			1927-	Everett & Monte Cristo RR		57		1892-1900
Erickson Lg Co	Elwah	10		1914-1934	(Rockefeller interests) Snohomish, Skykomish & Spokane Ry		6	1	1891-1892
Peterson Lg Co	Dungeness			-1914					
Geo W Evans & Co	Seattle		2g	1906-	Hartford Shingle Co	Sisco	4		1916-
Everett Lg Co	Bothell	5	1g	1907-1915	Haskins & Haskins	Mineral	2	1g	1931-1933
	Tulalip	10	3g 1r	1915-1929	Haverstick L Co	Sumas	1		(1907, 1910)
Faber Lg Co	Faber	1		1920-1921	W R Hawthorne Lg Co	Bremerton	5	1g	(1915)-1926
Fairfax L Co	Fairfax	16	3g	1934-1936	Healy & Sisco	Marysville		1g	1896-(1901)
Fairhaven & Southern RR (Lake Whatcom Lg Co) (Seattle & Montana RR) (Great Northern interests)	Bellingham	64		1888-1917	Frank Henry	Bellingham	2	1r	(1910)
Fairservice-Gierin T Co	Port Angeles	5	1g	1898-1898	Hewitt-Lea L Co	Bellevue	10	1g	1906-1920
Faler & Davidson, Inc	Quilcene	2	1g	1926-1933	Hewitt Lg Co	Hoquiam	4	1r	(1907)-1915
Far West L Co	Tacoma	3	1r	1924-1926	High Point M Co	Fall City	6	1g	1918-1928
Feazle Lg Co	Skamokawa	7	1g 1r	1905-1909	Hill Lg Co	Adna	5	2g 1r	1912-1919
D Ferguson	Warnick			1918-1930	Hillman's Snohomish Cnty Land & Ry Co	Snohomish	6		1908-(1913)
Fern Creek L Co	Frances	2	1g	(1907)-1908					
Ferndale L Co	Oakville			1903-(1913)	Hilo L Co	Robe	2		1926-1929
Fidelity L Co	Newport	2	1g	(1908)-1913	Hobi T Co	Aberdeen	25	3r	1923-1932
D J Finn Lg Co	Stevenson	1	1r	(1909)-1915	Henry Hoeck	Frankfort	1	1g	(1907)
Fir Tree L Co	Olympia	5	2r	(1917)-1919	Hoff & Pinkey, Inc	Lawrence	5	1g	1923-1934
J M Fish	Bothell	3	1g	1914-1924	Hogg-Houghton Lg Co	Glacier	3	1g	1923-1931
Fisher's Lg RR	King Cnty			(1908)	Holly Lg Co	Hood Canal			(1907)
Flaherty & Daly	Port Angeles	2		(1907)	Hood Canal Lg Co	Hoodport	4	1g	1923-1927
Flanigan L Co	Ethel	2		1926-1928	Hoquiam L & Shingle Co	Hoquiam			(1910)
Fobes-Wilson Lg Co	Maple Falls	2	1g	1919-	Houghton Lg Co	McMurray	12	2g	1905-1924
Fobes Lg Co	Wickersham	7	1g	1921-1926	Atlas L (& Shingle) Co	McMurray	7	2	1901-1923
Christie T Co	Wickersham	9	1g	1923-1926	Howe-McGibbon T Co	Nagrom	4	2g	1926-1933
Fobes T Co	Colville	3	2g	(1917)-1923	Hulbert L Co	Lk Stevens	5	1g	(1907)-1923
Forbes T Co	Nagrom	3	2g	(1927)	Hulbert Lg Co	Everett	2	1g	(1909, 1913)
Ford's Mill	Matlock	1	1g	1918-1929	Huron L Co	Bothell	4	1r	(1889, 1890)
Forest L Co	Acme	1		1918-1919	M Huston	Montesano			(1909)
Fortson Lg Co	Darrington	2	1g	1921-1924	Hynes Lg Co	Robe	2	1	1929-1931
Sol Foss	Montesano	2	1	1913-1921	Index-Galena L Co	Index	14	2g	1910-1928
Foster-Newbegin L Co	Graham	10	2g	(1910)	Puget Sound, Skykomish & Eastern RR	Index	2		1910-(1913)
Foster L Co	Tacoma			1918-1926					
T A Foster L Co	Morton	8		(1909)	Ingersoll Shingle Mfg Co	Shelton	1		1918-1919
L B Frazier & Son	Okanogan	5		(1951)	Inland Lg Co	Morton	3	1g 2r	1921-
Frederickson Lg & L Co	Skamokawa	5	1g	1937-1938	Linco Log & L Co	Morton		1g	1920-1921
Frederickson L Co	Shelton			1926-1929	Inman-Poulsen Lg Co	Stella	12	2g 2r	(1907)-1923
	Frederickson	2	1r	(1927)	Joe Irving	Arlington	4		1898-1903
Jacobson L Co	Frederickson	1		1909-(1910)	J K L Co	Hamilton Crk	9	2g	1913-1918
Fredson Bros Lg Co	Shelton	25	2g	(1907)-1909	Hamilton Crk RR Co	Hamilton Crk	8	1g	1913
Cushman Lg Co				1905-1928	Jackson Lg Co	Arlington	3		(1947)
French & Woodin Lg Co	Bothell	8	1g	1909-1912	Jackson Lg RR	Mt Vernon	2		(1887, 1890)
Emil Fullner	Deming	2		1931-1933	Jacobson L Co	Tacoma	1		(1907)-1908
William Gage	Skagit Cnty	2	1	1884-	Jamison L & Shingle Co	Darrington	14		1923-
Galbraith (Bros) Lg Co (1)	Clipper	4	1g	1923-1947	Jefferson Cnty Lg Co	Port Ludlow	5	2g	1913-1916
Gamney & Scott	Arlington			(1904)	G B Jenison	Blaine			(1910)
Gardiner T & Land Co	Discovery Bay	3	1g	(1907)-1919	Sam Jenkins	Toledo			(1901)
Gate City L Co	Thurston Cnty			(1912)	Jennings & Nestos Lg Co	Rockport	3	2r	1923-1936
Gatewood & Lasley Lg Co	Snohomish		1g	(1912)	Joe Creek Lg Co	Pacific Bch	4	1g	1916-1919
Gay Lg Co	Arlington	1		1910-1912	Wiest & Thompson	Pacific Bch		1	1915-1916
Gillies M & Mfg Co	Nooksack			1924-1926	C J Johansen & Co	Morton	1	1g	1921
Dan Gillis	Montesano			1909-	Johnson-Dean L Co	Robe	12	3g	1908-1918
Globe L Co	Frances	4	2r	(1901)	Johnson Creek L Co	Bucoda	7	1g	1909-1915
				1905-1927	J J Johnson	Frances	2	1r	(1907)

Name	Location	Mile- age	Locomo- tives	Dates	Name	Location	Mile- age	Locomo- tives	Dates
Kalb & Larkin	Raymond			1910-1912	Marysville & Arlington RR	Arlington	16	4g	1909-1925
Armstrong-Leonard Lg Co	Raymond			1905-1910	Allen C Mason	Shelton	5		(1892)
Kangley T Co	Maple Valley	2	1g	1911-(1913)	Mason Cnty Lg Co	Olympia	85	4g 6r	1891-1941
Keefe Lg Co	Eatonville	1	1r	(1923)	Black Hills & North- western RR	Olympia	20	3g 1r	(1907, 1913)
Kellogg Shingle Co	Big Lake			(1910)	Vance L Co	Elma	10	2g	(1906)-1923
Kelso Eastern	Kelso	4		(1928)-1930	May Creek Lg Co	Renton	6	1g	1909-1911
Kent L Co	Maple Valley	15	2g 1r	1902-1923	Fish & Peterson	Renton	5	1g	1908-1909
Kirby Bros	Tenino	1		(1925)	French, Fish & Peterson	Renton	3	1r	(1907)-1908
Kirby M Co	Yelm	2	1r	1912-	Maytown L Co	Tenino	5	1g 1r	1912-1924
(Merrick-Robb L Co)					D H McCall	Yacolt	7		1927-
North Star L Co	Yelm	3	1r	1908-1912	A McCann	North Bend	2	1	(1910)
Lindburg & Shuh Lg Co	Yelm	1	1r	(1907)-1908	McCaughy M Co (1)	Fortson	3	1g	1909-1929
Kittitas L Co	Ellensburg	2	1g	1923-1927	McCleary T Co	McCleary	12	3r	(1903)-1931
Klement & Kennedy	Darrington	6	3g	1921-1936	Mosher & McDonald Lg Co	Olympia	12	1g 1r	1894-1905
KLICKITAT LOG & L CO	Klickitat	20	2g	1922-present	Puget Sound & Chehalis Ry Co	Olympia	12	1r	1888-1894
(St Regis Paper Co)				1957-present	Shamrock & Western Ry	McCleary		2	-1931
(J Neils L Co)				1922-1957	Jameson Lg Co	Olympia		1r	-1905
Klickitat Northern RR		16	3g	1915-1922	McCormick L Co	Pe Ell	12	2g 1r	1908-1930
(Western Pine L Co)				1918-1922	H McCormick L Co	Pe Ell	4	1r	(1896)-1908
A H Kneeland	Shelton	3	1g	1906-(1910)	McCormick & Columbia River RR	Pe Ell	22	1r	1906-(1912)
C F Kneeland Lg Co	Union	4	1g	1924-	McCoy-Loggie T Co	Deming	12	1g 1r	(1902)-1923
Wm Knight & Co	Skagit Cnty	3	1g	(1892)	Pat McCoy	Edison	7	1g	1902-1911
A W Knight & Co	Maple Falls	4	1g	(1917)-1921	Geo McCoy	Napavine	2		(1907)
KOSMOS T CO	Kosmos	90	8	1939-present	Wm McCush Lg Co	Bellingham	4	1r	(1907, 1913)
(U S Plywood Corp)					McCuish Lg Co	Prairie	8	2g	1923-1924
Kuhn Lg Co	Hoquiam		1g	(1907)	D McDougall	Buckley	1		(1913)
Lacamas Lg Co	Chehalis	8	2g	1922-1926	McDougall & Jackson	Buckley	2	1g	1901-1909
La Grande L Co	La Grande	1	1	1926-1929	J W McFaddon Lg Co	Tacoma	2	1g	(1907)-1911
Lake Cle Elum L Co	Cle Elum	1	1g	1922-1933	McIntosh & Swan	Olympia	3		1908-(1910)
Lake Creek L Co	Morton	1		1921-1924	McIntosh & Weller	Olympia	2		(1907)-1908
Lake Goodwin Shingle M Co	Marysville	6	1	(1910)-1912	McKay & Swan	Tenino	2	2g 1r	1926-1929
Lake Riley L Co	Hazel	4		1914-1922	McKenna L Co	McKenna	18	1g 2r	1914-1932
Lake Sawyer L Co (1)	Issaquah	4	1g 1r	1922-1934	Salsich L Co	McKenna	9	2	1908-1914
Neukirchen Bros Inc	Issaquah	3		1918-1922	McMillan L Co	Orting	5	1g	1916-1929
Lakeshore RR	Snohomish			(1893)	McNeill-O'Hearne Co	Concrete	4	1g	1921-1926
Lamson Lg Co	Darrington	4	1g	1923-1933	McReavy & Co	Shelton		2r	(1883)
Landreth Bros L Co	Wenatchee	2	1g	1922-1932	Mealy L Co	Chehalis		1	1900-
Thomas Larkin	Menlo	3	1g	(1917)	Meiklejohn & Brown Co	Monroe	1		(1917)-1920
Lawson Lg Co	Stevenson	5	1g	1921-1927	Mendota T Co	Centralia	1	1r	1919-1921
Lay L Co	Big Lake		1g	(1916)	L B Menefee L Co	Winlock	9	2g	1919-1923
Lazarus (Bros) Lg Co	Carnation	4	2g	1921-1931	Black Diamond L Co	Winlock	16	3g	1917-1919
Leavitt & Leathers, Inc	Marblemount	9		1938-1940	J A Veness L Co	Winlock	16	2g	(1904)-1917
C M Leavitt	Issaquah	3		(1931)	Mentzer Bros L Co	Tacoma		2	(1891)-1902
Lebam M & T Co	Lebam	5	2g	1906-1927	Meredith L Co	Kent	3		(1913)
Leitch L Co	Ashford	1		(1917)	Merrill & Ring L Co	Pysht	30	5g	1916-1944
Leudinghaus L Co	Dryad	10	3g	1919-1929	Mukilteo Lg Co	Mukilteo	14	2g	1908-1916
Leudinghaus Bros (2)	Dryad	5	1g 1r	1903-1919	Mid-Columbia L Co	Mukilteo	5	2g	(1907)-1908
Meskill L Co	Dryad	4	1g	1914-1921	Midland L Co	Carson	30	1g 2r	1926-1933
J R Cain L Co	Dryad	3	1g	1909-1912	Midway Lg Co	Tacoma	6	1g	1918-1920
Meskill & Columbia River Ry	Dryad			1913-(1915)	Miller & Dunn	Stella		1g	(1909)
Libby-Hay Lg Co	Shelton	2	1g	1908-(1910)	Geo Miller	Cle Elum	1	1g	1922-1924
Liberty Lg Co	Eatonville	12		1918-	Ward-Sargent Lg Co	Markham	6	1	1932-1933
Tidewater L Co	Eatonville	11	1g 2r	(1905)-1918	J B Miller Lg Co	Markham	6	1g	1923-1932
Liberty L Co	Wickersham		1g	1913-	Miller Lg Co	Cathlamet	10	1r	(1907, 1916)
Linberg L Co	Pierce Cnty	2		(1909)	M C Miller L Co	Sultan	25	4g	1923-1940
Lincoln Creek L Co	Centralia	10	3g	1906-1932	Millett & McKay	Cle Elum	2	1	1935-1943
Lindberg & Hobl Co	Mineral		1g	1944-1947	Milsap-Dickey Co	Burlington	2		1883-(1889)
Linde Shingle Co	Carlisle	2	1g	1923-1933	Swan-Hamann L Co	White Salmon	2		1918-1919
Lindstrom-Handforth L Co	Rainier	10	1g 1r	1910-1929	Mineral Creek L Co	White Salmon	2		(1912)-1916
Bob White L Co	Rainier	4	1r	1906-1910	Mineral Lake Lg Co	Mineral		1g	1926-1932
Little Falls L Co	Long Lake		1g	(1908)	(Weyerhaeuser T Co)	Ashford	10	1g 1r	1911-1926
Little Mashell L Co	Elbe	3		1908-(1909)	Minnesota RR (Minnesota L Co)	Mt Vernon	3	1r	(1907)-1911
Little Rock L Co	Olympia	2	1g	(1910)	Moe Bros	Poulsbo	6	1g	1907-1911
Lochsloy T Co (1)	Everett	5	1g	1905-1923	Mogul Lg Co	Bellingham	5	1g	1904-1911
Star Lg Co	Hartford	5	1g	(1907)-1923	Monarch T Co	Tacoma	6		1908-(1913)
Loeb-Cutler L Co	Granite Falls		1g	(1906)	Monroe Investment Co	Monroe	2		(1909, 1913)
Long-Bell L Co	Longview	56	3g 10r	1924-1953	Monroe Lg Co	Lake Stevens	25	2g 2r	1922-1947
Long Lake L Co (1)	Spokane			1924-1933	Montborne L Co	Big Lake	12	3g	1926-1931
Phoenix L Co	Springdale	14	2g	1906-1924	Montgomery & Kelly (3)	Clark Creek		1	(1899)
Hedlund L & Mfg Co	Marcus	32	3g	1927-1933	Mooers Lg Co	Skamokawa	4	1g	1923-1933
Edwards & Bradford L Co	Elk	25	4g	1916-1932	Moore Lg Co	Wickersham	6	1g	(1909, 1913)
Consolidated L Co	Elk	18	3g	1902-1916	Morgan Bros L Co	Nagrom	6	2g 1r	1904-1924
LONGVIEW, PORTLAND & NORTHERN RY	Longview	32	5	1924-present	Morrison M Co	Bellingham			(1907, 1915)
(International Paper Co)				1956-present	Mountain T Co	Kalama	13	3g	1910-1926
(Long-Bell L Co)				1924-1956	Willard-Case L Co	Kalama	5		-1910
Lowell Lg RR	Everett	5		(1887)-1890	Mud Bay Lg Co (51)	Olympia	35	3g 3r	1906-1941
Lucas-Stronach L Co	Tacoma	2	1	(1910)	Thurston Cnty (Central) Ry		13	1g 2r	1908-1918
Lucas L Co	Eagle Gorge	3	1	1910-	Muck Creek T Co	Roy	1		(1909)
Lyle-McNeil & Co (3)	Deming			(1928)	Mukilteo & Lk Wash Ry	Mukilteo		1g	1904-1909
Lynch Creek Lg Co	Kapowsin	1		(1907, 1910)	Mukilteo L Co	Mukilteo	4		1904-(1908)
Lyon & Haynes	Mineral	2	1g	1931-1932	Mullenix Bros, Inc	Pe Ell	1	1	1938-1951
Lytile-Inch Lg Co	Morton	6	1g	(1923)-1924	Multnomah L & Box Co	Grays River	9	3g	(1917)-1921
Lytile Lg & Mercantile Co	Elma	8	2g	(1906)-1929	Murphy T Co	Carrolls	4	2g	(1917)-1919
Porter RR	Elma	4	2	(1907, 1910)	Murphy-Scott L Co	Yacolt	5	2g 1r	(1915)-1926
Hoquiam River Ry	Hoquiam	3		1910-(1917)	James E Murray	Tacoma	2	1g 1r	(1907)-1911
M & M T & Realty Co	Mineral			1932-	Mutual L Co (2)	Oakville	1		1900-1908
M B Lg Co	Markham	15	3	1923-1951	Mentzer Bros L Co	Tenino	25	4g	1913-1943
Markham Shingle Co	Markham	3		(1931, 1932)	Myers L Co	Tenino	4	1r	(1902)-1913
Mack Lg & T Co	Redondo	5	1g	(1913, 1917)	N & M L Co (1)	South Prairie	3	2g	1908-(1910)
Main Lg Co	Shelton	7	1g 1r	1923-1934	Napavine L & Mfg Co	Rochester	5	3g	1906-1924
Malone Creek Lg Co	Grays River	4	1g	1929-1931	Somerville (Bros) L Co	Napavine	7	2g	1909-1919
Malone Mercantile Co	Elma		1g	1908-(1912)	Naselle River RR (Spruce Prod Div #VII)	Napavine	6	1r	1898-1916
A C Manning Lg Co	Lk Whatcom	6	1g	(1915, 1917)	National Sash & Door Co	Naselle	2		1918
(Bloedel-Donovan L Mills)					Geo M Neidhart	Chewelah	6	1g	1923-1929
Manley-Moore L Co	Fairfax	17	4g	1910-1934	J Neils L Co	Custer	2	1r	1928-1929
Maple Valley L & Mfg Co	South Prairie	1	1r	(1908)-1910	Western Pine L Co (1)	Klickitat	32	3g	1922-1952
Marcilla L Co	Maple Valley	3	1g	1904-(1913)	Mt Adams Pine Co	Klickitat	4	3g	1909-1922
Markham & Callow	Chehalis	1	1g	1926-1933		Glenwood	3		1927-1931
The Marsh Co	Independence		3g	(1928)					
H H Martin L Co	Chehalis	5	1g	1929-1932					
Maryvott & Spencer Lg Co	Centralia	12	2g 1r	1903-1924					
Dungeness Lg Co	Brinnon	7	2g	1918-1919					
Pacific Lg & T Co	Dungeness	15	2g	1912-1918					
	Dungeness	5	1g	1908-1912					

Name	Location	Mile- age	Locomo- tives	Dates	Name	Location	Mile- age	Locomo- tives	Dates
Nelson-Neal L Co	Bryant	5	1g	1908-1925	Port Susan Lg Co	Silvana	8	2g 1r	1897-1907
The Chas Nelson Co	Port Angeles	7	2g	1926-1929	Port Townsend & Pacific RR	Port Townsend	13		(1907, 1908)
Puget Sound M & T Co	Port Crescent	27	6g	(1907)-1926	PORT TOWNSEND RR	Port Townsend	12	2	1945-present
Little Riv Ry & Lg Co	Port Crescent	6	2g	1910-1916	Port Townsend Southn RR	Port Townsend	12		1929-1945
Pt Crsnt T Trnsptn	Port Crescent			1910-(1911)	Port Townsend &	Port Townsend	27	1r	1914-1929
Nemah River Lg Co	Raymond	14	2g 1r	1919-1936	Puget Sound Ry Co	Port Townsend	26		1891-1914
North Nemah RR	Raymond	8		1918-1919	Southern RR (53)	Olympia	17	2r	1881-1891
(Spruce Prod Div #V)					Olympia & Chehalis Valley RR Co		15	2r	1878-1881
Nesbit Bros	Kelso	17		1937-1947	Olympia & Tenino RR				
Nettleton-Bruce Lg Co	So Prairie	4	1g	1918-1926	Thurston Cnty RR	Winlock	1		1905-1912
Nettleton Bruce & Eshback	Chehalis		1r	(1917)	S W Porter				
Neut & Packard Lg Co	King Cnty			1911-(1913)	Portland, Vancouver & Yakima Ry (12)	Vancouver	20	4r	1897-1903
Newaukum M Co	Napavine	2	1r	1906-1911	Vancouver, Klickitat & Yakima RR	Vancouver	13		1888-1897
Newaukum River L Co	Onalaska	1		1918-1919	Prescott & Veness L Co (4)	Winlock	1	1r	1899-1906
Newkshamp's RR	Mt Vernon	2		(1887, 1890)	Preston M Co	Preston	8	2g	1914-1936
Ninemire & Morgan L Co	Rochester	4	3g	1918-1921	PUGET SOUND & BAKER RIVER RY	Hamilton	26	2r	1906-present
Nordby & Scott	Klickitat	2	1g	1915-1922	(Scott Paper Co)				1951-present
Mrs J Norstrom & Son (52)	Everett	3	1	(1915)-1926	(Soundview Pulp Co)				1937-1951
J E Norstrom	Everett	2	1	1909-(1915)	(Lyman T Co)				1930-1937
North Bank L Co	Grays River	12	3g	1913-1919	(English-Dempsey)				1906-1930
North Bend T Co	North Bend	32	4g	1923-1944	Hamilton & Baker River RR				
North Bend L Co	North Bend	9	2g	1906-1923	Puget Sound & Cascade Ry Co	Mt Vernon	27	1g 1r	1912-1938
North Bend & Eastn RR	North Bend	9	2	1910-1915	(Puget Sound Pulp & T Co)				1929-1938
North End L Co	Tacoma	3		1906-1911	(Clear Lake L Co)				1913-1929
North Fork Lg Co	Shelton	1	1g	1908-1911	(Skagit Lg Co)				1912-1913
North River Lg Co	Ariel	9	3g	1907-1928	Puget Sound & Willapa Harbor Ry Co (11)	Raymond	60		1913-1918
North Point RR Co	Aberdeen	1		1929-1939	Pacific & Eastern Ry Co	Raymond	7	2g 1r	1907-1913
(Northwest Door Co)	Stella	1		(1908, 1910)	Puget Sound Electric Ry Co	Milton	8	1r	(1907, 1910)
North Western L Co	Hoquiam	32	4g 2r	1917-1941	Puget Sound Mills & T Co	Bellingham	18		1898-1909
Northern Coast T Co	Maple Valley	14	1g 1r	(1907, 1915)	Puget Sound Pulp & T Co	Bellingham	40	5g 1r	1929-1952
Northwest L Co	Cedar Falls	15	3g	1908-1929	Rucker Bros Co (1)	Hartford	11	1g 1r	(1905)-1929
Kerry M Co	Cedar Falls	8	2g 2r	1897-1908	Tulalip Co	Hartford	5	1g	(1917)-1919
Northwood Cedar Co	Bellingham	4		(1900)	Cavanaugh T Co	Hartford	10	3	1909-1918
Oak Point Piling & L Co	Stella	8	2g	1904-(1913)	Hartford Mfg Co	Hartford	1	1g	(1907)-1909
Oakland Bay Lg Co	Shelton	4	1g	1909-1922	S E Wright Lg Co (7)	Hartford	9	3g	(1907)-1909
Ohio Match Co	Metaline Falls	3	1g	1921-1930	Rucker M Co	Hartford		2g	(1905)-1909
Ohms & Ragen	Pomeroy	2		(1910)	Puget Sound Sawmills & Shingle Co	Bellingham	30	3g	1918-1931
Olson Bros	Deep River		1	1901-(1904)	Puyallup Valley L Co	Puyallup	3	1g	(1906)-1909
Olson Bros L Co	Oakville	1		1926-1928	Quinault L Co	Raymond	4	2	1908-(1915)
Olympia & Mt Rainier RR	Olympia	3	1	1886-(1890)	Kalb-Gilbert L Co	Raymond	1	1r	1906-1908
Ellis Lg Road	Olympia		1g	(1885)-1886	Quinault Shingle Co	Humtulpils			(1918)
Olympia Lg Co	Olympia		1g	(1890's)	Rainier Lg Co	Everett	12	3	(1907)-1924
Olympia, Sherman Valley & Grays Harbor RR & L Co	Olympia			1890-	Rapjohn T Co	Kapowsin	11	1g 2r	(1921)
Oregon & Washington Lg Co	Glacier		1g	(1910)	Raymond L Co	Raymond	13	3g	1909-1931
Oregon L Co	Cooks	5	1r	(1904, 1907)	Frances Lg Co	Frances		1g	1910-1912
Oregon Rafting Co	Toledo	2	1r	(1907, 1910)	Green Creek RR	Menlo	1		1909-(1915)
Oso Lg Co	Oso	6	2g	1906-1911	RAYONIER, INC	Hoquiam	100	12	1945-present
Ostrander Ry & T Co	Kelso	31	5g 2r	(1892)-1940	Ozette T Co	Beaver	30	2g	1940-1954
Overton Lg Co	Allyn	3	1g	1926-1934	Poison Lg Co	Hoquiam	85	5g 7r	1895-1946
Overton L Co	Orting	3	1g	1916-1919	Ozette Ry Co	Hoquiam			(1936)
Pacific & Eastern Ry (11)	Raymond	8	2g 1r	1907-1913	Airplane Spruce & L Co	Hoquiam	15		1918-1919
Pacific Lg Co	Deep River	10	4g	(1907, 1914)	Bloedel-Donovan L Mills	Sekiu	150	12	1923-1945
Pacific National L Co	Ashford	12	3g 2r	1905-1949	Goodyear Lg Co	Sekiu	14	2g	1915-1923
D & M L Co	Sumner	4	1g	1913-1921	Clallam Bay & Southern RR				(1925)
Pacific States L Co	So Prairie			1911-1913	Rayville Shingle Co	Elma	2		(1912)
Seattle Southeastern Ry	Cedar Falls	46	3r 3g	1905-1939	J F Rea Lg Co	Castle Rock	5	2g	1908-1912
Packwood Lg Co	Bucoda	2		1906-(1913)	Chas E England	Castle Rock	4	2g	1905-1908
Paradise Lake Ry & M Co	Woodinville		1g	(1926)-1927	Red Cedar Shingle Co	Rochester	1	1r	(1908)
J H Parker Lg Co	Hartford	1	1g	(1901)	H E Reed Lg Co	Morton	1	1g	1928-1929
Pe Ell L Co	Pe Ell	14	2g	1908-1909	Rellance L Co	Alder	8	1g	1909-1918
Pe Ell Sawmill	Pe Ell	4	1r	1926-1931	Excelsior L Co	Alder	1		1908-1909
Pearce & Balch Mill	Pe Ell			(1907)-1908	Fred C Duke	Alder	2		1904-
Pelton-Armstrong Co	Centralia			-1916	J F Res Lg Co	Cowlitz Cnty	3		(1909)
PENINSULAR RY CO	Cathlamet	7	2g	1901-1912	Richardson & Ring	Monroe	4		1909-1911
(Simpson T Co)	Shelton	50	6r	1895-present	T M Ring Lg Co	Monroe	4	1g	1909
Washington Southern RR	Shelton	30		1890-1895	Riley Bros	Port Townsend	3	1g	(1906, 1907)
Satsop RR Co	Shelton	14	3r	1885-1890	River Lg Co	Hoquiam	8	1g	1923-1926
Stimson M Co	McCleary	31	2g 1r	1916-1926	Riverside T Co	Hood Canal	16	1g	(1907)-1918
The Blakely Road	Kamilche	50	3g 6r	1896-1916	(Schwager-Nettleton M)				
Puget Sound & Grays Harbor RR	Kamilche	32	1r	1886-1896	Robe & Menzel L Co	Granite Falls	4	2g	1906-1909
Little Skookum & Chehalis RR					Robe L Co	Robe	3		1931-1938
A P Perry L Co	Rainier	6	1g	1911-1922	Roberts Lg Co	Elma			1926-1927
Clear Lake Lg Co	Rainier	5	1g	1915-1919	D A Robertson	Sekiu	5	1	1902-1905
Lawrence M Peters	Randle	5		1951-1953	Rose Point Lg Co	Allyn	8	1	(1927)
W H Peters Lg Co	Onalaska	10	2g	1924-1926	O A Rosendahl	North River	3		1901-(1902)
Robt W Peterson	Woodinville	4	1g	(1907-1913)	Royce L Co	Eatonville	2	1r	1910-1920
Phoenix Lg Co	Hoodspout	41	5g	1900-1939	Taybor-Royce Co	Eatonville	4	1r	(1907)-1910
Ping Pong RR	Elma	2	1	(1910)-1916	Ryan Lg Co	Stevenson	11	3	1924-1938
(Elma Shingle Co)					Ryan-Allen LCo (1)	Stevenson	5	2g	(1915)-1934
Hamilton Pitcher Co	Napavine	3	2g	1901-1911	John Ryan & Co (4)	Port Ludlow		1g	1915-(1917)
Great Southwestern RR	Napavine	5	1r	(1910)-1911	Saginaw T Co	Aberdeen	40	2g 5r	1909-1947
D J Platt & Co	Frances	1	1g	1909-1912	Grays Harbor & Pac RR Co	Aberdeen	9		1930-1933
Pope & Talbot	Port Gamble	52	4	1936-1939	E H Lester Lg Co	Montesano	2	1g	1909-1919
Chas R McCormick L Co	Port Gamble	30	2g	1925-1936	Saginaw Southern Ry Co	Aberdeen			1913-
	Port Ludlow	5		1932-1936	ST REGIS PULP & PAPER CO	Tacoma	23	4	1943-present
	Castle Rock	15	1g 1r	1930-1936	West Fork Lg Co	Mineral	25	4g 1r	1911-1955
	Union	40	2g 1r	1925-1936	St Paul & Tacoma L Co	Tacoma	120	6g 3r	1887-1949
	Port Gamble	5	2g	(1889)-1925	Nooksack T Co	Denning	12	2g	1922-1929
Puget M Co (1)					Natches Pass RR Co	Buckley	11	1g 1r	1896-1909
(Pope & Talbot)					White & Columbia Rivers RR Co				1893-1896
Union Riv Lg RR Co (1)	Union	10	1r	1883-1925					
(Puguet M Co)									
West Fork Lg Co	Seabeck	16	3g	1923-1927					
Discovery & Quilcene RR	Quilcene	15	2g 1r	1926-1932					
Port Angeles & Pacific RR	Port Angeles	5	1	1903-1907					
Port Angeles Westn Ry (11)	Port Angeles	60	5	1925-1951					
Clallam County RR	Port Crescent	36		1918-1925					
(Spruce Prod Div #I)									
Seattle, Pt Angeles & Western Ry Co	Port Angeles	38		1915-1918					
(Milwaukee Road)									
Seattle, Pt Angeles & Lk Crescent Ry (11)	Port Angeles	23		1914-1915					

Name	Location	Mile- age	Locomo- tives	Dates	Name	Location	Mile- age	Locomo- tives	Dates
Tacoma, Orting & Southeastern Ry (12)	Orting	11		1889-1893	Stetson & Post L Co	Maple Valley	8	2g	(1917)-1927
Tacoma Southern	Orting			1888-1889	Stevenson L Co	Stevenson	1		1923-1924
Saldern Lg Co	Grays River	8	1g 1r	(1899)-1908	Stimson M Co	Marysville	26	2g 3r	1890-1926
Salmon Creek L Co	Olympia	2		1909-1912	Bryant L & Shingle Co	Bryant	5		(1903)-1904
Samish Bay Lg Co	Bellingham	10	2g	1912-1929	Marysville & Northern Ry	Marysville	26	2g 1r	1904-1922
Peter Sandberg	Tacoma	1		(1913)	Stimson T Co	Belfair	10	2g	1914-1933
Sara Lg Co	Ridgefield	9	2r	(1901)-1911	Ulner Stinson	Snohomish	2		1882-(1890)
Sauk River L Co	Darrington	35	4g	1924-1952	Stone Bros	Tenino		1	(1906)
Schafer Bros Lg Co	Aberdeen	155	9g 7r	1913-1955	C E Stone L Co	Ridgefield	3		1911-(1913)
Chehalis Cnty Lg & T Co	Montesano	13	3g 1r	1902-1923	Storey T Co	Tacoma	14		1912-(1914)
(Grays Harbor Comm'l Co)					Sultan Ry & T Co	Sultan	20	5g	1902-1941
Sylvia Shingle Co	Montesano			(1904, 1912)	Standard Ry & T Co	Hazel	12	3	1906-1913
Montesano & Northern RR	Montesano	10	2	(1910, 1913)	Sumner L Co	Sumner	5		(1887, 1889)
Independence Lg Co	Aberdeen	22	4	1920-1927	Superior Log & Spar Co	Onalaska	3	1g	1920-1924
Wilson Bros Co	Aberdeen	10	2g 1r	(1907)-1920	(Multnomah L & Box Co)				
National L & Mfg Co	Elma	25	2g 2r	1913-1927	Swan L Co	Tolt	10	1g	1931-1947
Washington-Ohio L Co	Hoquiam	1		(1908)-1913	Swan & McKay Lg Co	Tolt	5	1g	1927-1931
Wynoochee T Co	Hoquiam	16	4r	1916-1924	Stillwater L Co (1)	Fall City	4		(1906)-1927
Schmidt Shingle M	Shelton	2	1g	(1921)	Syversen & Hill	Adna		1g	1913-
Schwager & Nettleton L Co	Bothell	7		(1907)-1912	Syversen L Co	Adna			(1902)-1913
Scott Bros Lg Co (3)	Concrete		1	(1923)	Tacoma Eastern Ry (11)	Tacoma	127	12	1893-1918
Seattle & Inland RR	King Cnty		1r	(1900)	J F Hart & Co	Tacoma	3		(1887)-1890
Seattle & Northern Ry Co (14)	Anacortes	36		1888-1900	Tacoma, Olympia & Grays	Centralia	32		1891-1892
Seattle-Issaquah Elec Ry	Seattle	5		(1913)	Harbor RR Co (12)				
Seattle Cedar L Co	Seattle		1g	(1901)	Tacoma Olympia & Chehalis Valley RR	Centralia	32		1888-1891
Seattle, Lake Shore & Eastern Ry Co (12)	Seattle	119	16	1885-1892	(Ellensburg Lg Road)				
Seattle Lg Co	Port Crescent	8	2g	1898-(1903)	Tacoma Shingle Mfg Co	Raymond	3	1	1900-
Seattle L Co	Bremerton	4	1g	1902-1916	Tanwax & Western RR	Kapowsin	5	2r	1907-1919
Seattle Supply Co	Bellevue			(1910)	Storey T Co)				
Securities Lg Co	Tolt		1g	1924-	Taylor M Co	Bellevue	4	1g	1909-1916
Security T Co	Everett	7	1g	1928-1938	Rainier Beach Lg Co	Bellevue	4	1g	(1907)-1909
Alpine L Co	Skykomish	4	1g	1920-1928	J S Taylor	Lk Sammamish		1	1893-
Nippon L Co	Skykomish	3	1g	1918-1920	C A Taylor L Co	Kelso		1g	(1906)
H O Seiffert L Co	Everett	2		(1910)	Teanaway Lg RR	Cle Elum	20	2r	1916-1919
Severson L Co	McMurray	1		1925-1926	(A Guthrie & Co)				
Seymore-Kahalee Lg Co	Snohomish			1910-1912	Tenino L Co (1)	Tenino	1	2	1905-(1919)
Shebelin RR Co	Cowlitz Cnty	2		(1909)	Thorndyke Bay Lg Co	Poulsbo	2	1	1925-1926
Shelton Lg Co	Shelton	2	1	1909-(1913)	Tongue Point L Co	Longview	3	1g	1906-1908
Shelton South Western					Three Lakes L Co	Snohomish	16	3g	1904-1921
Washington Ry	Shelton	12		1898-1903	Sterling M Co	Snohomish	5	1g	1902-1904
Shelton Southwestern RR	Shelton	15	2	1892-1898	Panther Lake Co	Snohomish	16	3g	1921-1930
Mason Cnty Central RR	Shelton	20		1886-1892	Washington Western Ry	Snohomish	12	2	1912-1930
Sherman Bros L Co	Castle Rock	1		1923-1926	Trap Creek Lg Co	Menlo	8	2g	1916-1928
Sherman L Co	Olympia			1909-	Trout Creek Lg Co	Index	7	1g	1923-1926
Allen & Sherman L Co	Olympia	3	1g	(1907)-1909	Turlo L Co	Robe	3	1r	1930-1938
Allen's Mill RR	Olympia		1	(1902)	Turvey Bros Lg Co	Tenino	16	1g 1r	1917-1933
E C Shevlin T Co	Kalama	2	1g 1r	1908-(1915)	Skookum L Co	Tenino	14	1g 2r	1916-1929
Shevlin-Ducey Co	Kalama	1	1r	(1907)-1908	Elumauer L Co	Tenino	6	1g	1906-1916
Siler Lg Co	Monroe		2g 3r	1923-1931	Skookum Ry & Lg Co	Tenino	15	2r	1916-1929
(Port Blakely M Co)					Tyee Lg Co	Conway			(1904, 1905)
Florence Lg Co	Monroe	17	1g 1r	1910-1923	Ultican & Rosencrantz T Co	Centralia	2	1	1925-1926
(Port Blakely M Co)					Union City Lg Co	Union	4	1g	1926-1927
Harry Siler	Monroe			1905-	Union L Co	Olympia	12	2g 2r	1902-1927
Siler M Co	Raymond	1		1906-(1910)	Union Mfg Co	Lynden	2	1	1910-1912
Silver Falls Lg Co	Elbe	4	2g	1924-1929	Union M & T Co	Baring		1	1932-1933
Silver Lake Ry & T Co	Castle Rock	12	2g 1r	1904-1925	United States L Co	Darrington	4	1r	(1907)-1913
Simpson Lg Co	Shelton	70	3g 4r	1895-1959	Valley M Co	Buckley	3	1	1909-(1913)
Siverson Bros	Newman Lake	5		1935-1939	Veness & Baldwin	Winlock			(1905, 1907)
Skagit M Co	Lyman	15	2g	1908-1940	Veness & Shives	Winlock	2	1	1925-1926
Skamania Lg Co	Skamania	6	1g	1926-1938	J A Veness L Co	Winlock	9	1g 1r	1904-1921
Basin Lg Co	Skamania	7	1g	1918-1923	Wabash L & Shingle Co	Centralia		1g	1913-1914
Greenleaf L Co	Skamania	8	1g	1923-1926	Salzer Valley L Co	Centralia	3	1g	1904-1913
Skamokawa T Co	Skamokawa	6	1g 1r	1921-1926	Geo Wagner L Co	Monroe	12	2g	1918-1933
Skewis L Co	Kapowsin	2		1908-1912	Wagner & Wilson, Inc	Monroe	10	3g	1906-1918
Slade-Wells Lg Co	Aberdeen	5	1g	1915-1917	Stevens Bros	Monroe	8	1g	1902-1906
S E Slade L Co	Aberdeen	9	3	1905-1915	Waite (Bros) M & T Co	Granite Falls	20	2g	1909-1926
Mack Lg Co	Aberdeen	6	1r	(1897)-1905	Wall L Co (1)	Amboy	8	1g	1923-1928
Slosson Lg Co	Mt Vernon	4		1912-(1913)	Etna Lg Co	Amboy	8	1g	1917-1923
E D Smith	Everett			1883-	Harvey M Co	Amboy	2		1915-1917
Kay Smith	Brinnon	9	2g	1920-1927	Wallace Falls T Co	Gold Bar	20	3g	1921-1941
Upper Sound Lg Co		6	1g	1915-1920	Wallace L & Mfg Co (2)	Sultan	12	3g	(1907)-1936
M R Smith L & Shingle Co	Moclips	12	1g 1r	1922-1938	Walsh L Co	Orient			1910-
Snohomish Lg Co	Snohomish	15	4g	1901-1919	Walville L Co	Pe Ell	7	2g 1r	1908-1931
Snoqualmie Falls L Co	Snoqualmie	100	2g 4r	1917-1942	Walworth & Neville Mfg	Pe Ell	3	1g 2r	(1905)-1908
(Weyerhaeuser T Co)					Warnick L Co	Bellingham	2	1g	1926-1936
Snoqualmie Lg Co		4		(1913)	Glacier L Co	Glacier	1		1922-1925
Snoqualmie M Co	North Bend		1r	1890-	Warren Lg Co	Raymond	1		(1910)
Snow Creek Lg Co	Sequim	18	3g	1914-1926	Washington Fir L Co	Winlock	8	2g	1918-1926
Sequim Lg Co	Sequim	2	1g	1908-1914	Washington L & Spar Co	Darrington	4	22g	1921-1927
Snow L & Shingle Co	Chehalis	12	2g 1r	1914-1929	Washington Mfg Co	Fairfax	3	1r	(1910)
Snowden L Co	Klickitat	2	1g	(1928)	Washington M Co	Seabeck	2		(1887, 1889)
Snowdon Ousley Lg Co	Eldon	5	1g	(1910)	Washington Northern RR Co	Prindle	20	2g	1912-1918
Sobey Mfg Co	Granite Falls	7	2	1909-1912	(Blazier Lg Co)				
Soule Lg Co	Frances	1		1902-1911	Cape Horn RE Co				1908-1912
The Sound T Co	Darrington	38	3g	1916-1942	(Ore & Wash Lg Co)				
(Weyerhaeuser T Co)					Washington Ry	Allyn	4		1888-
Soundview Pulp Co	Hamilton	6	2	1937-1951	Washington State Lg Co	Shelton	5	2g	1921-1931
Lyman T Co	Hamilton	15	4g	1905-1937	Washington T & L Co	Darrington	5	1g	1906-(1913)
South Fork L Co	North Bend	2	1r	1908-(1913)	Washington Veneer Co	Darrington	50	3	1941-1952
South Prairie L Co	South Prairie	3	1g	1925-1926	(Weyerhaeuser T Co)				1941-1947
South Tacoma M Co	South Tacoma	7	1g	(1907, 1913)	(Georgia-Pacific Corp)				1947-1952
Spring Hill L Co	Issaquah	1		1935-1942	Washougal RR	Washougal			(1887)
Standard Box & L Co	Stella	6	2	(1910)	Webb Lg & T Co	Brinnon	20	3g	1920-1930
Standard L & Shingle Co	Clipper	5	1g	(1906, 1910)	Weeks & Co	North Bend	8	1g 1r	(1907, 1913)
Star M Co	Battleground		1g	1918-1922	Weist Lg Co	Coweman			1911-
Stearns Lg Co	Carlisle	5	2g	1921-1940	Welbon Bros L Co	Snohomish	1	1r	1920-1923
Steelman Lg Co	Skamokawa	1	1r	(1908)	Wenatchee Southern Ry Co	Wenatchee	11		1922-1931
Stephens-Bird Lg Co (2)	Monroe	15	3g	1907-1926	Wentworth Lg Co	South Bend	2	1g	1908-1915
High Rock Lg Co	Monroe		2g	(1909)-1912	Wentworth & Cole	South Bend	1	1g	1907-1908
Forks Lg Co	Monroe	9	2g	1905-1912	West Coast T Co	Everson	3		(1907)-1908
Pendleton & Gilkey	Monroe	6	2	1903-1905	West Fir Lg Co	Olympia	4	1g	1929-1932
Pendleton & Fifield	Monroe			1901-1903	West Pacific Lg & L Co	Stevenson			(1916)
Sterling M Co	Rochester	2	1	1909-	Western Crossarm & Mfg Co	Centralia	14	2g	1925-1930
H A Hawkins	Napavine	2	1r	(1907)-1909	Western Lg Co	Ocosta	6	1g	(1940)-1941

Name	Location	Mile- age	Locomo- tives	Dates	Name	Location	Mile- age	Locomo- tives	Dates
Western T Co	Winlock	5	3g	1916-1919	Larsen T Co	Marshfield	2	1g	(1908)-1909
Western Washington Lg Co	Vaughn	2		(1913)	Beaver Lg Co	Quincy	5	1g	1909-(1910)
Westport Lg Co	Shelton	10	2g 2r	(1906)-1911	Joe Erickson & Son	Quincy	2	1g	1906-1909
WEYERHAEUSER CO	Morton		1g	(1912)	Beck & Hess	Camas Valley	18		1944-1947
	Longview	194	12	1929-present	Roy A Beebe	Leona	5	2g	1927-1933
	Vail	125	4g 8r	1927-present	A W Bell L Co	Wemme	2	1	1929-1943
Weyerhaeuser T Co	Enumclaw	100	5g 1r	1949-1953	Benson Lg & Lumbering Co	Clatskanie	16	4g 1r	1903-1936
White River L Co	Enumclaw	100	5g 1r	1902-1949	Clatskanie & Nehalem				
North Coast T Co	Alder	14	1g 2r	1905-1916	RR (41)		8	5	1904-1908
Weyerhaeuser T Co	Montesano	65	2g 4r	1936-1947	Berst & Cox Lg Co	Timber	1	1g	(1916)-1918
Clemons Lg Co	Montesano	75	4g 3r	1919-1936	Best & Laird	Bandon	1		1928-
(Weyerhaeuser T Co)					Best L Mfg Co (4)	Philomath	1	1	(1931)
C H Clemons Lg Co	Montesano	13	3g	1903-1919	Big Creek & Telocaset RR	Pondosa	11	2	1928-1959
Melbourne & North	Montesano	8	2g	1903-1919	(Templeton L Co)				
River RR					(Collins Pine Co)				
Whitcom Cnty Shingle Co	Blaine	4	1r	1908-1917	(Grand Ronde Pine Co)				
Wheeler-Osgood Co	Wickersham	5		1909-1912	(Stoddard L Co)				
	North Bend	9		1923	Big Lakes Box Co	Klamath Falls	22	1g	1926-1944
Whipple Creek Lg Road	Woodland			(1907)	Blue Lake Lg Co	Cochran	18	2g	1927-1938
A E White	Olympia	2		1911-(1912)	Blue Mountain RR	Meacham	6	1g	(1907, 1912)
White Bros	McCleary	2	1g 1r	1908-1911	(Hilgard L Co)				
White Star L Co	Elma	10	2g 1r	1905-1937	Blue Ridge RR	North Bend	10	1g	1900-(1912)
Whitlatch L Co	Yelm			1913-	(North Bend Mills)				
Whitman Cnty L Co	Farmington	2	1g	1927-1929	Bohemia L Co	Culp Creek	3	1g	1915-1947
Codd & Allen	Farmington	2	1g	1926-1927	Row River L Co	Culp Creek	1	1	1910-1915
Wickersham Lg Co (1)	Wickersham	4		(1916)-1943	Bonlokke & Nelson	Yamhill	5	1g	1927-1934
W C Wicks	North Bend			1902-	Booth-Kelly L Co	Springfield	35	3g 3r	1902-1945
Wikstrom Lg & T Co	Ilwaco	1	1g	(1923)	Bowman-Hicks L Co	La Grande	65	4g 3r	(1905)-1936
Wilbur Lg Co	Woodinville	2	1g	(1907)	Geo Palmer L Co	La Grande	38	4g	1907-1922
Willapa Harbor L Mills	Raymond	66	6g 1r	1931-1942	Bradley-Woodard L Co	Bradwood	11	3g	1931-1940
(Weyerhaeuser T Co)					Bramhall L Co	Haley Sta	3	1g	1910-
Sunset T Co	Raymond	21	2g	1915-1931	Northwest Log & L Co	Barton	3	1r	1906-1910
Lewis Mills & T Co	South Bend	5	1g	1922-1931	Braymill White Pine Co	Braymill	8	2g	1927-1933
South Bend Mills & T Co	South Bend	6	2g	1909-1921	Brewold Pine Co	O'Brien	1		1947-1951
Willapa Lg RR Co	Raymond	56	2r	1931-1944	Bridal Veil Lumber Co (2)	Palmer	16	3r	(1898)-1941
Willapacific Lg Co	Raymond	1	1g	1931-1933	Gordon Crk & Palmer RR	Palmer	4	1g	1924-
T H Williams & Co	Snohomish	8	1g	(1906, 1913)	Briggs L Co	Umpqua	18		1936-1938
F F Williamson	Shelton	20	1r	(1886)-1900	Brighton Mills Co	Brighton	7	2g	(1915)-1927
Wilson & McRae Lg Co	Maple Falls	9	1g	1924-1926	Brix Lg Co	Holbrook	16	4g 2r	1926-1940
Wilson & Olsen	La Center		1	(1902)	B-W T Co	Jewell	15	3g 3r	1927-1929
C H Wilson L Co	Deming		1g	1935-1937	Brix L Co	Astoria	8	2g	(1899, 1913)
Wind River L Co	Carson	10	1g 2r	1912-1926	Brooks-Scanlon L Co	Bend	100	1g 5r	1915-1956
Windsor, McDonald & Co	Bothell			1888-	Brown L Co	Cottage Grove			1906-
Winkleman L Co	So Prairie	5	1r	(1905)-1911	Delbert Burnham	Rainier	1		1952-1956
Winlock-Toledo L Co	Winlock	19	5g	1929-1932	Butler Lg Co	Elsie			1937-1938
Winlock & Toledo Lg & RR Co	Winlock	25	3g	1923-1929	Butte Creek L Co	Scotts Mills	2	1g	1928-1933
Winlock Lg Co	Winlock	8	2g	1916-1923	Butte Falls L Co	Butte Falls			(1913)-1918
O'Connell L Co (7)	Winlock	16	3g 2r	1906-1916	Calif & Oregon Coast RR	Grants Pass	15	3	1913-1954
Winlock L Co	Winlock	5	2g	(1906, 1907)	Grants Pass & Eureka RR				
Winslow L Co	Colville	20	1g	1910-1934	Grants Pass & Crescent City RR				
Colville & Eastern Ry Co	Colville	20	1g	1906-1910	Calif Oregon & Eastern				
Winston L & T Co	Chehalis	6	1g	1929-1940	Pacific Interior RR				
Wisconsin Lg & T Co	Stella	17	3g 1r	1906-1923	Grants Pass & Western Ry				
Benson Lg & L Co	Stella	20	7g 1r	1891-1906	Oregon Coast RR				
Wisconsin L Co	Chehalis	6	1g 1r	1904-(1913)	Calif & Ore L Co	Brookings	30	3g 1r	1916-1925
F W Wonn	Nagrom	1	1r	1926-1927	Brookings T & L Co	Brookings	6	2g	1914-1916
Wood-Acme Lg Co	Acme	3	2g	1938-1940	Cameron-Hogg L Co	Bull Run	4	1g	1918-1927
Wood-Knight Lg Co	Bellingham	5	3g	1920-1936	Cameron L Co	Kings Valley	8	1	1924-1928
Woodinville L Co	Snohomish	5	2g	1906-1912	Campbell & Swigert	West Fork	3	1r	(1907)-1913
Workman Creek Lg Co	Elma	5	1g	1923-1927	Carlton & Coast RR	Carlton	30	4g 2r	1913-1939
Bale Lg Co	Houquiam	4	1g	(1915)-1923	(Flora Lg Co)				1921-1939
Yakima Sash & Box Co (4)	Naches	3	1	1929-1930	(Carlton Consol L Co)				1911-1921
Yale-Columbia L Co	Yale			(1908)	Carlton & Washington RR	Carlton	16		1911-1913
Yeomans L Co	Pe Ell	8	1g 1r	1903-1931	Carter Lg Co	Myrtle Point	2		-1924
Pe Ell & Columbia River	Pe Ell	7	1r	1909-1919	Cascade M RR	Cascade Locks	2		(1887, 1891)
Ry Co					Case L Co	Rainier	2		(1908)
Young-Johnson L Co	Kapowin	1		1909-(1913)	Central RR of Ore	Union	19	3	1906-1927
Young Bros	Castle Rock	3	1r	(1900, 1902)	(Blue Mtn L Co)				
Yuill & Allen	Sumas	1		(1907)-1908	Geo H Chaney Lg Co	Coquille	7	1g	1910-1933

OREGON

Name	Location	Mile- age	Locomo- tives	Dates	Name	Location	Mile- age	Locomo- tives	Dates
Aagard L Co	Glenwood	2	1g	1920-1923	Clackamas Eastern	Clackamas	19	1	1929-1940
J L Aasen	Coquille	3	1g	1923-1926	RR Co (10)	Clackamas	14	1	-1929
Schroeder & Aasen	Coquille	2	1r	1920-1923	Portland Southern Ry Co	Clackamas	2	1g	1929-1939
Aasen Bros (2)	Coquille	2	1g 1r	1898-1920	Clackamas Fir L Co	Beaver Creek	98	7g 5r	1905-1943
Ackley Bros (6) (39)	Keno			1917-(1936)	Clark & Wilson L Co	Goble	12	3g 1r	1902-1923
				1905-1913	Goble, Nehalem & Pac Ry				
Addison L Co	Lorane	3	1g	1931-1941	(Columbia T Co)				
Albany L Co	Albany	2		1916-	Goble & Nehalem RR Co	Goble	6		1901-1902
Albama L Co	Klamath Falls	30	1g 2r	1903-1943	Read & Pelton	Goble			1905-1907
Allen & Murphy L Co	Grant County			1920-1921	Nehalem T & Lg Co	Scappoose	5		(1904)-1926
O R Menefee L Co	Grant County			-1920	Clark's Sawmill	Oregon City			(1910)
Anderson & Middleton L Co	Cottage Grove	10	2g	1923-1928	E H Cline	Marshland	1	1g	(1907, 1910)
J H Chambers L Co	Cottage Grove	22	3r	1911-1923	John Clinton	Riverton			1900-
Chas Anderson	Willamina	1		(1928)	Coast Range L Co	Mabel	13	2g	1911-1926
C C Arney	Scappoose	3	1	1934-1936	Sunset L Co	Mabel	2	1	(1910)-1911
Astoria & Columbia Riv RR	Astoria	100	9	1896-1907	Coats Driving & Boom Co	Tillamook	15	2g	1915-1943
Seashore RR	Astoria	17	1	1893-1896	Cochran & Southern RR Co	Cochran	2	1	1924-1933
Astoria & Portland RR	Astoria	16	1	1892-1893	James Cole	Summit	3	2g	1919-1921
Astoria & South Coast	Astoria				Devitt L Co	Summit	2	1g	1918-1919
RR					E S Collins	Molalla	3		1937-1938
Astoria Southern Ry Co	Astoria	16	1	1888-1892	Columbia & Nehalem Lg Co				(1906)
(Tidewater T Co)		27		1910-1943	Columbia City & Nehalem				
(Western Cooperage Co)				1923-1943	RR				
Astoria T & L Co	Holbrook		1g		Columbia Riv & Nehalem RR	Columbia City	1		1903-(1904)
Balderee & Ritner Lg Co	Yaquina	3	1g	1929-1930	Henry Colvin	Tillamook Cnty			(1903)
R G Balderee Lg Co	Salem	5	1g	1920-1946	Colwell & Fowler Lg Co	Marshland			(1899, 1904)
Baldrige Lg Co	Reedsport	3	2g	1931-1938	CONDON, KINZUA & SOUTHERN RR	Astoria	2	1g	(1910)
Ball L Co	Glide	2		1950-1951	(Wheeler T Co)	Kinzua	27	1g	1927-present
Bay Park L Co	North Bend			(1920)	(Kinzua Pine Mills)				
Bear Creek Lg Co	Kerry	6	2g	1916-1922	Connacher Lg Co	Vernonia	14	2g	1924-1941
Beaver Creek Lg Co	Vernonia	4	1g	1922-1925	Consolidated T Co (42)	Glenwood	100	8	1934-1944
Beaver Hill T Co	Marshfield	3	2g	1909-	Coos Bay Lg Co	Coos Bay		1g	1900-(1907)
					Coos Bay Lg Co	North Bend	5	3g	1920-1942

Name	Location	Mile- age	Locomo- tives	Dates	Name	Location	Mile- age	Locomo- tives	Dates
McDonald & Vaughan Co	North Bend	12	2g	(1913)-1920	Green Mountain Lg Co	Kerry	2	2g	1922-1927
Simpson L Co	Daniels Crk	10	1g	(1898)-1916	(Dollar-Portland L Co)				
Blue Ridge Ry & Nav Co	Daniels Crk	10	1	-1909	J P Guerrier L Co	Buckner	1		1925-1926
Coos Bay, Roseburg & Eastern RR & Nav Co (10)	Marshfield	31	4	1891-1915	Hadsall Creek Lg Co	Mapleton	3	1g	1931-1933
Isthmus Ry (6)	Marshfield			1874-1890	Hammaker & Hild	Lakeview	5		1939-1940
Coos Bay T Co	Marshfield		1g	(1909)	Hammond-Tillamook L Co	Garibaldi	20	3g 1r	1927-1936
Coos Cedar Co	Coquille	2	1g	1923-1935	Hammond L Co	Astoria	18	2g 6r	1895-1927
Crillis & Alsea Riv Ry (18)	Corvallis	7	1g	1908-1911	Oak Point RR	Astoria	5		1913-
Corvallis Lg Co	Monroe	15	2g	1920-1939	Continental L Co	Garibaldi	12		1927
Corvallis L & Mfg Co	Corvallis	4	1g	1915-1920	Whitney Co	Garibaldi	15	1g 1r	1892-1927
Crater Lake Box & L Co	Sprague Riv	15	1r	1938-1942	L B Hanna T Co	Kerry	3	1g	(1923)
Crater Lake L Co	Sprague Riv	14	1r	1931-1938	Haskell-Carpenter Co	Cherry Grove	6	1g 1r	1915-1928
Crooked Creek L Co	Lakeview	1		1926-(1927)	Herren Lg Co	Westlake	4	1g	1931
Crown T Co	Mapleton	2		1926-	Hills Creek L Co	Booth	2	1	1934-1942
Crown Zellerbach Corp	Seaside	30	3g	1928-1937	Hillsboro Lg Co	Jasper	1		1931-1942
Crown Willamette Paper Co	Seaside	30	4g 2r	1914-1928	EDWARD HINES L CO	Buxton		1g	(1899)
Willamette Pulp & Paper	Seaside	4	1g	1903-1914	OREGON & NORTH- WESTERN RR	Hines	74	2g 3r	1928-present
Crown Columbia Paper	Astoria		1g	1890's-1914	Malfleur RR	Burns	51	3r	1928-present
Culver L Co	Lakeside	7	2g 1r	1929-1930	(Herrick L Co)		51		1924-1927
Dallas & Ellendale Ry	Dallas	5	1g	1891	Edward Hines L Co	Westfir	20	3	1946-1956
Dallas L & Lg Co	Dallas	3		(1912)	Westfir L Co	Westfir	20	1g 2r	1937-1946
Davenport Bros	Haynes Spur			(1900)-1905	Hobson Bros	Murphy	7		1940-1946
Dean L Co	Marshfield	2	1r	(1905, 1907)	Henry Hoeck & Co	Marshfield			(1910, 1915)
Delta Shingle Co	Florence	4	1g 1r	1918-1926	Hoebet Lg Co	Adair		1g	(1906)
Dixon & Howitt	Cherryville	1		1925-1933	Hoover L Co	Hoover	2		-1916
Dollar L Co	Bandon	10	1	(1899)-1916	Horton L & T Co (4)	Horton	17	2	1927-1931
Lyons-Johnson L Co	Prosper			(1913)-1915	Max H Houser	Warrenton	5		1920-
ROBERT DOLLAR CO	Glendale	2	1g 1r	1931-present	Hutchinson Lg Co	Newport	18	3g	1928-1936
Eugene L Co	Holley	3	5	1935-1942	Wilbur Hyland	Noti			(1916)
Ingham L Co	Glendale	12	2	1932-1945	Inman-Poulsen L Co	Keasey	8	3g 1r	1923-1930
Glendale L Co	Fernvale	8	1g 1r	(1908)-1932	Interstate Lg Co	Glenwood		1g 1r	1938-1940
Drug & Blachly	Blachly	2		(1910)	Jacobsen-Reid L Co	Rainier	1	1g	1917-1919
Durable Fir L Co	Dorena	35	3	1937-1946	Jamestown-Oregon L Co	Alpine	7	2g	1923-1929
Dwyer L Co	Boring	7	1g 1r	(1915)-1923	Jennings & McEae Lg Co	Coos Bay	3	1g	1906-(1914)
Dwyer Lg Co	Timber	1	1g	1938-1940	Johnson L Co	Coquille	2	1r	1902-1914
East Side Lg Co	Keasey	22	3g	1923-1933	Seeley & Anderson Lg Co	Coquille	3	1r	1908-1914
Miller-Cox Lg Co	Timber	2	1g	1918-1923	Seeley & Thomas	Coquille	1	1r	(1907)-1908
Rock Creek Lg Co	Keasey	3	1g	1924-1926	Al V Johnson L Co	Grand Ronde	1	1	1928-1929
East Side M & L Co	Sellwood	2	1	1903-(1910)	C McC Johnson L Co	Reedsport	3	1g	1921-1928
Eastern & Western L Co	Molalla	30	3g 2r	1927-1935	Ralph Johnson Sawmill	Vaughn	8		(1947)
W H Eccles L Co	Austin	15	2g	1911-1926	W W Johnson L Co	Westport	3	1g	(1908, 1910)
G S Elder & Sons	Williams	25		1935-1938	K C L Co	Wheeler			(1917)
Elliott & Elwood Lg Co	Olney	3	1g	1918-1919	K-P T Co	Kerry	53	9g 7r	1925-1938
Veness & Malone	Olney		1g	1916-1918	Kerry T Co	Kerry	6	3g	1915-1925
Elrod & Wills	Reedsport			1929-	Columbia & Nehalem				
Elwood L Co	Buxton	5	1g	1928-1941	River RR	Clatskanie	32	6r	1915-1925
Elwood Lg Co	Kerry	2	1g	1919-1928	Keith Sawmill	Harrisburg	1		1928-1929
Elwood & Snow	Birkenfeld	1	1g	1916-1919	D L Kelly L Co	Warrenton	4	1g	1905-(1910)
England & Cyphers	Gaylord		1g	(1906)	Flavel L & Shingle Co	Warrenton			1904-1905
Everding & Farrell	HQ Portland		1g	1905-	Kesterson L Corp	Klamath Falls	25	2	1930-1941
Ewauna Box Co	Klamath Falls	40	2g 1r	1924-1948	Kiernan-Flora Lg Co	Kerry	7	2g	1919-1923
Falls City L & Lg Co	Falls City	6	2g	1906-1919	Kings Valley L Co	Airline	1	1g	(1917)-1919
Teal Creek RR	Falls City			(1916)-1919	Robt C Kinney Lg Co	Astoria	3	1g	1919-1926
Fall Creek M Co	Scappoose	3	1	1929-1931	Kinzua Pine Mills Co	Kinzua	14	3	1927-1951
S M Feazle Lg Co	Cochran	1	1r	1930-1941	Kirby L Co	Willamina	2	1	(1928)
Fire & Pine L Co	Glendale	4	2g	1919-1920	Klamath Lg & T Co	Odessa	4	1g	(1917)-1919
Fir & Spruce L Co	Toledo	3	1r	1909-(1912)	KLAMATH NORTHERN RY	Gilchrist	11	1	1938-present
Fir L Co	Cottage Grove			1910-	(Gilchrist T Co)				
Fir Tree L Co	Scappoose	12	3	1910-(1911)	Klamath T Co	Klamath Falls		2	(1942)
Chapman T Co	Scappoose	12	3	-1910	Knappa Lg Co	Knappa	7	2	(1942)
Pacific & Portland Ry	Scappoose	6	1r	1910-	Knappont Lg Co	Holbrook	3	1g	1924-
Fischer-Boutin L Co	Glentina	1	1r	(1915)-1919	Sorenson & Wiest Lg Co	Holbrook	3	2g	1922-1924
Fischer-Itzel Lg Co	Olney	3	1g	1919-1923	Hauser Const Co	Holbrook	3	2g	1920-1922
Fischer L Co	Marcola	12	2g	1911-1939	Grant Smith & Co	Holbrook	3	2g	1918-1920
Fisher & Bally	Marcola		1	(1916)	Koster Products Co	Astoria	11	3g	1919-1939
Fishhawk Lg Co	Kerry	2	1g	1915-1919	Calif Barrel Co	Olney	6	2g	1918-1919
Flora Lg Co	Carlton	20	1g 2r	1923-1940	Kramer L Co	Grand Ronde	1	1	1929-1931
Carlton Consolidated L Co	Carlton	21	2g	1910-1923	LaDee Lg Co	Estacada	25	1r 2g	1926-1932
Forcia & Larsen	Noti	2	1g	1923-1934	Porter-Carstens Lg Co	Estacada	1	1g	1923-1926
Forest L Co	Chiloquin	35	3g 1r	1898-(1910)	LaDee Lg Co	Kerry	5	3g	1918-1934
Forest L Co	Pine Ridge	15		-1926	Porter Carstens Lg Co	Kerry	5	3g	1922-1926
J L Goldthwaite L Co	Pine Ridge			-1926	Eastern & Western L Co	Astoria	30	2g 2r	1920-1929
Foster Mills, Inc	Willamina	7	2	1931-1943	Lewis & Clark Riv RR Co	Clatsop	18	2g 5r	1918-1922
Foster L Co	Willamina	2	1	1925-1931	(Spruce Prod Div #IX)				
Fountain-Campbell L Co	Sprague Riv			1929-	Saddle Mtn Lg Co	Astoria	23	1g 3r	1920-1923
Campbell-Towle L Co	Sprague Riv			-1929	Laird & Garrett (3)	Myrtle Point			1926-1927
G H P L Co	Hillsboro		1g		Lamb T Co	Deer Island			1916-
Gales Creek & Wilson	Greenwood	16	2r	1917-1943	Lamford L Co	Mt Vernon	41		1951-1953
River RR (13)					Lamm L Co	Modoc Point	50	1g 1r	1915-1944
Gales Creek Lg Co	Glenwood	5	2g	1923-1933	Larkin-Green Lg Co	Blind Slough	15	1g 2r	1910-1926
J K Gamble Lg Co	Birkenfeld	3	1g	1916-1919	E G Larkins	Beaver Creek	3		1928-1929
Gardiner L Co	La Grande			1926-	Larsen T Co	Coos Bay	2	2g	(1908)
Gardiner M Co	Gardiner	5	2g	(1906)-1917	Laurel L Co (4)	Hillsboro	1	1	(1931)
Jewett M Co	Gardiner	4	1g	1917-1927	Lawson Creek Lg Co	Cushman		1g	(1906)
A E Gault	Coos Bay	1	1r	(1931)	Lawson Cypress L Co	Coos Bay	5	1g	1926-1930
Georgia-Pacific Corp	Toledo	12	4r	1951-1959	Leland L Co	Grants Pass	1	1r	1921-1924
C D Johnson L Corp	Toledo	48	1g 4r	1922-1951	Leona Mills L Co	Leona	8	2g	1913-1924
Pacific Spruce RR Co	Toledo	1		1921-1922	Lewis & Clark Narrow Gauge RR	Clatsop Cnty	3		1917-1918
Story & Miller	Toledo	1		1919-1920	(Spruce Prod Div #VIII)				
Pacific Spruce Corp	Toledo	60	2g 4r	1920-1935	Lewis-Peters L Co	Dexter	2	1	1929-1933
Alsea Southern RR	Toledo	27		1918-1920	E F Libke	Astoria	3	1g	1908-(1910)
(Spruce Prod Dix #XII)					Lincoln County Lg Co	Taft	5	2g	1928-1941
Pac Spruce Northn Ry	Toledo	7		1923-(1924)	Lincoln-Toledo L Co	Toledo	9	2r	1920-
Manary Lg Co	Toledo	39	2g 4r	1922-1926	Fischer-Storey L Co	Toledo	9	2r	1919-1920
GEORGIA-PACIFIC CORP	Coos Bay	70	3r	1956-present	Yaquina Bay RR & L Co	Toledo	7	1r	1918-1919
Coos Bay L Co	Coos Bay	75	10g 5r	1908-1956	International Paper Co	Vernonia	35	3g 3r	1956-1957
Smith-Powers Lg Co	Coos Bay	28	9g 3r	1908-1926	Long-Bell L Co	Vernonia	35	3g 3r	1953-1956
C A Smith L & Mfg Co	Coos Bay	90	5	1908-1915	Oregon-American L Co	Vernonia	35	3g 3r	1922-1953
Giustina Bros L Co	Eugene	8	2	1929-1941	LONGVIEW, PORTLAND & NORTHERN RY	Grand Ronde	9	2	1955-present
Goble Milling Co	Goble	1		(1908, 1910)	(International Paper Co)	Reedsport	3		1952-present
Gold Hill L & Ry Co	Gold Hill	6	1g	1910-1919	(Long-Bell L Co)				1955-1956
Grand Ronde L Co	Willamina	1	1g	1927-1928					
Great Western L Co	Black Rock	3	1g	1909-1913					

[illegible]

Name	Location	Mile- age	Locomo- tives	Dates
Southeast Portland L Co	Boring	25	1	1934-1938
Bear Creek Lg Co	Boring	20	3g 1r	1923-1934
Southern Oregon Co (1) (Simpson L Co)	Empire	8	2r	1884-1919
Southern Oregon RR Co				(1890's)
Spaulding-Jennings Lg Co	Westport	20	5g	1901-
Chas K Spaulding Lg Co	Newberg	21	3g 2r	1906-1938
Spaulding-Miami L Co	Grand Ronde	21	3g 2r	1921-1924
Marys River Lg Co	Philomath	11	2g	1916-1926
H E Spencer	Elgin			(1912)
Standard Box & L Co	Sciofield	8	2g	1913-1928
Standard Lg Co	Cochran	22	4	1938-1944
Star Lg & L Co	Rainier			(1900)
E C Steiger	Gold Hill	2		(1912)
J J Steiger	Chiloquin			(1916)
Stevens-Farris L Co	Walton	2	1r	1920-1925
Stimson L Co	Forest Grove	18	3	1932-1952
Stoddard L Co	Baker	60	8g	1914-1943
Stoddard Bros L Co	Baker	5	2g	1898-1914
Baker White Pine L Co	Baker	32	4g	1912-1929
Grande Ronde Pine Co	Pondosa	35	3g	1930-1943
Storey-Keeler L Co	Cascade Lks		1g	1901-(1902)
Stouder Lg Co	Alsea	5		1951-1956
Stout L Co	North Bend	18	5g 1r	1923-1926
North Bend M & L Co (Simpson L Co)	North Bend	7	2g	1900-1923
Buehner L Co	North Bend	7	3g	1916-1923
Sturdevant & Crane	Coquille	3	2r	(1907)-1923
Sugar Pine L Co	Ashland	30		1945-1947
Summit L Co	Clatskanie	1	1g	(1910, 1912)
Summit T Co	Cochran		1g	(1915)
SUMPTER VALLEY RY (Oregon L Co)	Baker	80	11	1891-present
Sunset Lg Co	Timber	18	3g	1923-1949
Syverson Bros (3)	Beaver		1	1891-
The Dalles & Southern RR	The Dalles	40	2	1933-1936
Great Southern RR (Wasco Pine L Co)	The Dalles	40	2	1904-1933
Columbia Southern RR				1918
Thorsen-Hendrickson L Co	Toledo	9		1906-
Tichenor L Co	Clatskanie			1918-1919
Tide Creek L Co	Deer Island	2		1928-1933
Tideport Lg Co	Jewell	22	5g 2r	1923-1943
Tidewater T Co	Olney	35	3g 3r	1910-1923
Western Cooperage Co	Olney	20	3g 1r	1924-1926
Tillamook Spruce Co	Tillamook	1	2	1917-1919
Toledo & Siletz RR Co (Fischer-Storey L Co)	Toledo	10	2	1911-1917
(Bade L Co)				(1915)
Toledo-Siletz RR & Nav Co	Toledo			1935-1941
Toledo L Co	Toledo	15	5	(1942)-1946
Trask-Willamette Co	Carlton	3	1	1919-1920
Troland Lg Co	Glenwood	2	1g	1917-1919
E Turney & Sons	Seaside	2	1g	1924-1934
H E Noble L Co	Seaside	2	1g	1922-1947
Umpqua Mills & T Co	Reedsport	6	1g	1921-1922
United Railways (44)	Linnton	50		
Portland, Astoria & Pacific RR (Ore-Amer L Co)	Linnton	32	5r	
VALLEY & SILETZ RR CO (Boise-Cascade Corp) (Templeton L Co) (Cobbs & Mitchell) (Siletz L & Lg Co)	Hoskins	47	3	1916-present
Valsetz L Co	Valsetz		1	1947-1951
Cobbs & Mitchell	Valsetz	20	4g	1920-1947
Siletz L & Lg Co	Hoskins	4	2g	1919-1920
Veness & Shives	Timber	3	1g	1920-1923
Wallowa Pine L Co	Wallowa			1922-
Waluskie RR	Astoria	2	1	1886-(1890)
Warren & Scott (3)	Seaside			(1918)
Warren Spruce Co (Spruce Prod Div #XI)	Toledo	13	6g	1918-1920
Wauna L Co	Wauna	20	7g 1r	1941-1943
Crossett Western Co	Wauna	32	7g 1r	1912-1941
Columbia Valley L Co	Wauna	3		1911-1912
Big Creek Lg Co	Knappa	30	7g 1r	1912-1923
Weise Bros	Cottage Grove	2	1	1923-1926
Wells-Laber L Co	Rainier	2		(1912)
Wentworth Lg Co	Beaver Hill			1918-1919
West Coast Lg Co	Birkenfeld	1	1g	1938-1940
West Ore L Co	Clatskanie	5	2g	1909-1913
West Shore L Co	Cochran	2	1g	1930-1933
Western Cedar Co	Rainier	1	1	(1910, 1912)
WESTERN LG CO (Georgia-Pacific Corp) (Inman-Poulsen L Corp)	Rainier	1	1	(1910)
Western L & Export Co	Valsetz	3	2	1944-present
U S Lg Co	Cottage Grove	8	2g	1944-1954
Western L Co	Cottage Grove	6	1g	1919-1923
Western White Cedar Co	Westfir	16	2g 2r	(1915)-1919
Westport L Co	Westfield	4	2	1923-1936
The Westport L Co	Westport	5		1923-1929
Palmer-Owen Lg Co	Westport	7	2g	(1910, 1912)
WEYERHAEUSER CO	Kerry	4	1g	1920-1926
C H Wheeler	Klamath Falls	120	1g 3r	1917-1920
Eagle L Co	Springfield	31	2	1928-present
Wheeler L Co	Cochran	30	5g	1949-present
E G Whipple	Westtimber	6	3g	1909-1935
White Pine L Co	Wheeler		3g	1913-1926
Whitten & Bryant	Drain	6		1911-1919
Frances Wiest & Co	Klamath Falls	2	1g	1944-1947
Willamette Pacific RR Co (10)	Cochran	3	1g	1920-1931
(Wendling-Johnson L Co)	Cochran	3	1g	(1917)-1926
				1920-1923
	Florence			1911

Name	Location	Mile- age	Locomo- tives	Dates
Willamette River L Co	Oregon City	2	1g	1920-1922
Willamette Valley L Co	Dallas	35	4g 3r	1896-1948
Willamette Valley Southern RR (8)	Oregon City	45		1915-1935
Clackamas Southern RR	Oregon City	7		1913-1915
Willamina Lg Co	Willamina	2	1	(1931)
Williamson River Lg Co	Chiloquin	38	2g	1923-1925
Modoc L Co (2)	Chiloquin	28	2g	1918-1923
Wilson-Case L Co	Rainier	1		1905-1908
Winchester Bay L Co	Reedsport	8	2g	1920-1936
H-K Lg Co	Reedsport	3	1g	1922-1929
Wisconsin Lg & T Co	Coos Bay	15	4	1906-(1912)
Wolf Creek Lg Co	Timber	10		1930-
W A Woodward L Co	Cottage Grove	14	1g 1r	1925-1942
Wright-Blodgett Co	Jewell	25	6	1935-1938
Yaquina Northern RR (Multnomah L & Box Co) (Newport Port Commission) (U S Spruce Corp) (Warren Spruce Co) (Spruce Prod Div #XI)	Yaquina	16	6g	1918-1929
Yunker & Wiecks	Jewell	7		1936-1946

ARIZONA

Name	Location	Mile- age	Locomo- tives	Dates
APACHE RAILWAY CO (Southwest Forest Ind) (Southwest L Mills) (Cady L Corp) (Apache Lg Co) Herbert S McGaffey	McNary	140	6	1917-present 1960-present 1935-1960 1924-1935 1917-1924 1928-1929
Saginaw & Manistee L Co	Dam Valley			1906-1953
Arizona L & T Co	Williams	35	2g 2r	(1907)-1941
Greenlaw L Co	Flagstaff	33	2g 2r	1918-1923
Central Arizona Ry (Ariz L & T Co)	Flagstaff	36	4r	1888-(1919)
Ariz Mineral Belt RR	Flagstaff	36		1887-1888
Saginaw-Southern RR	Williams	16	2	1899-(1900)
SOUTHWEST FOREST IND	Flagstaff	35	4g	1960-present
Southwest L Mills	Flagstaff	20	1g 7r	1935-1960
Cady L Corp	Flagstaff	45	6r	1924-1935
Apache L Co	McNary	20	1g 5r	1924-1935
Standard L Co	McNary	9	2	1918-1924
Flagstaff L Co	Standard	20		(1925)-1927
Western Pine L & M Co	Flagstaff	44	3r	(1916)-1926
Navajo Southern RR Co	Flagstaff			1916-(1918)
Winona L Co	Holbrook			1913-1916
	Winona	8		1935-1936

COLORADO

Name	Location	Mile- age	Locomo- tives	Dates
Arapahoe, Jefferson & South Park Ry Co	Denver		1r	1868
Middle Park L Co	Fraser	6	1g	1906-1913
Colo Utah & Western RR	Fraser	6	1	(1910)
Colo Consolidated L Co	Boulder	16	1r	1906-(1912)
Rocky Mountain Ry Co	Boulder	15	2	1906-(1920)
Grand Lake L & Crate Co	Grand Lake	21		1935-1936
Montezuma L Co New Mexico L Co (McPhee & McGinty) Colo & Southwestern RR	Durango	5	2	1936-1949
Montezuma L Co	Durango	45	1g 4r	(1927)-1936
	Arloa	14	1r	(1927) 1908-1911

NEVADA

Name	Location	Mile- age	Locomo- tives	Dates
Crystal Bay RR (Sierra New Wood & L Co)	Crystal Bay	11	2r	1881-1896
S H Marlette	Crystal Bay	3		1888-1895
Marlette & Folsom	Crystal Bay	3		1888
Verdi L Co	Verdi	66	4g	(1901)-1926

NEW MEXICO

Name	Location	Mile- age	Locomo- tives	Dates
Alamogordo & Sacramento Mtn Ry Co (10)	Alamogordo	34	4	1898-1924
Geo E Brece L Co	Bernalillo	35	1g 5r	1923-1942
Continental Tie & L Co	Alamogordo	25	1g 3r	1927-
Cimarron & Northwestern RR	Cimarron	22	1r	1923-1929
Hallock & Howard L Co Lutcher & Moore L Co	Cimarron	24	1r	1907-1923
A B McGaffey Co	Ojo Caliente	27	1g 4r	1914-1927
McKinley Land & L Co	Albuquerque			(1930)
American L Co	Wingate	12	2g	1909-1930
Zuni Mountain RR	Albuquerque	56	3g 3r	1916-1926
New Mex (Land & T) Co	Albuquerque	50	2g 4r	(1905)-1916
White Pine L Co	Thoreau	40	6	(1908)-1916
Pagosa L Co	Albuquerque	67	5r	1931-1952
Prestridge & Seligman	Bernalillo	21	2g 2r	1924-1931
Rio Grande & Pagosa Spurs RR (New Mex L Co)	Dulce	20	3g 1r	(1910)-1931
Rio Grande & Southwstn RR	Grants	40		1938-1940
Santa Fe Northwestern RR	Edith	33	2g 4r	1895-(1910)
(New Mex Land & T Co)	Edith	42	2	1904-(1927)
(White Pine L Co)	Bernalillo	50	2r	1924-1941
Southwest L Co				1931-1941
Sacramento Mtn L Co				1924-1931
Alamogordo L Co	Alamogordo	30	5g	1921-1943
(El Paso & Northeastn Co)	Alamogordo	14	3g	1918-1921
	Alamogordo	15	4g	(1908)-1918

Name	Location	Mile-age	Loco-motives	Dates
UTAH				
Name	Location	Mile-age	Loco-motives	Dates
Geo C Kidder	Park City	2		(1887)
WYOMING				
Name	Location	Mile-age	Loco-motives	Dates
Laramie, Hahn's Park & Pacific Ry (54)	Fox Park			1900-1914
MONTANA				
Name	Location	Mile-age	Loco-motives	Dates
American T Co	Dayton	10	1g	1938-1940
Anaconda Copper Mining Co	Bonner	35	8g	1904-1949
Big Blackfoot Milling Co	Bonner	27	2g	(1900)-1915
Big Blackft Midland RR	Bonner	30	2	1903-1915
Western L Co (1)	Bonner	10	2g	1912-1928
W H Best	Bigfork	28		1937-1947
Brooks-Scanlon L Co	Eureka	9	2g	1922-1926
P L Howe L Mills	Eureka	9	3	(1919)-1922
Eureka L Co	Eureka	12	1	1915-1922
Lincoln Lg & L Co	Fortine	9	1g	1911-1918
Burlington L Co	Libby	6		(1912)
Casey Mining & Eqpt Co	Helena	8		(1951)
Columbia L Co	Columbia Fls	1		(1917)
Donlan Co	Arlee	10	2g	1920-1928
Empire L Co	Kalispell	3		1926-1930
Enterprise L Co	Kalispell	2		(1913)
E O Everson	Victor	5		1940-1947
Harper Lg Co	Victor	12	1g	1927-1938
Heron L Co	Arlee	20	2g	1925-1933
Hutchinson (Bros) L Co	Whitefish	2	1r	1909-1928
Isaacs L & Lath Co	Kalispell			1928-1929
Jessup Milling Co	Jessup	2		1911-1917
Hans Larson	Dayton	6	1	1934-
Livingston & Cottrell	Plains	14		1938-1939
Mann L Co	DeBorgia	11	1g 1r	1908-1925
Montana Lg Co	St Regis	15	2g	1918-1943
J Neils L Co	Libby	25	4g	1918-1956
Libby L Co	Libby	23	4g	1911-1918
(Chevlin-Hixon Co)				
Dawson L Co	Libby	8	1g	(1910)-1911
Polleys L Co	Ronan	11	2g	1911-1934
Pyfer's Sawmill	Whitehall	15		(1951)
Sage L Co	Twin Bridges	1		1950-1959
Sandpoint L & Pole Co	Troy			1922-(1927)
Somers L Co	Somers	47	1g 1r	1914-1942
John O'Brien L Co	Somers	12		1901-(1910)
F H Stolze Land & L Co	Columbia Fls	20	1g	1933-1946
State L Co	Columbia Fls	20	1g	1913-1933
Tuscor L Co	Trout Creek		1g	(1917)-1918
Warland L Co	Warland	20	3g	1924-1927
Baird-Harper L Co	Warland	18	3g	1910-1924
A O Westburg L Co	Columbia Fls	3	1r	(1915)-1932
W N Womack	W Yellowstone	4		1938-1940
WHITE SULPHUR SPRINGS & YELLOWSTONE PARK RY	W Sulphur Spg	27	2	1910-present

IDAHO				
Name	Location	Mile-age	Loco-motives	Dates
Atlas Tie Co	Coeur d'Alene	1		1915-(1927)
C W Beardmore	Priest River			1918-
Blackwell L Co	Coeur d'Alene	32	5g	1909-1936
B R Lewis L Co	Coeur d'Alene	15	2g	1904-1909
Coeur d'Alene Southn Ry	Coeur d'Alene	26	2g 1r	1909-(1913)
Ida & Northwestern RR	Coeur d'Alene	30	2g 1r	1905-1909
(B R Lewis L Co)				
N P Bogle	St. Maries			(1913)
Boise Payette L Co	Boise	32	6g	1913-1946
Intermountain Ry Co (1)	Boise	40	3g 2r	1914-1935
Boise Valley Ry Co	Boise			1905-
Bonnars Ferry L Co	Bonnars Ferry	15	1	1907-(1915)
G A Branson	Mashburn	2		1915-1916
H E Brown T Co	Naples	1		1925-1926
Coeur d'Alene M Co	Coeur d'Alene	17	5g	1927-1928
Cowger & Sons	Southwick	14		1934-1943
Craig Mtn L Co	Winchester	30	5	1910-1951
CRAIG MOUNTAIN RY	Winchester	8	2	1910-present
(Boise-Cascade Corp)				1960-present
(Hallack & Howard L Co)				1951-1960
(Craig Mtn L Co)				1910-1951
Winchester & Craig Jct RR				
Diamond Match Co (45)	Sandpoint	17	3	1927-1943
Burnt Creek RR				1924-
Dollar Lg Co	Wallace			1913-(1915)
Dover L Co	Sandpoint	7	1g	(1910)-1922
Downer Bros	Prairie	1		1953-1954
Grant L Co	Harrison	6	1g	1916-1919
Hallack & Howard L Co	Cascade	10	2g	1927-1938
Eccles L Co	Cascade	6	1g	1925-1927
Hedlund B & L Co	Worley	2	1g	1924-1926
Hopkins Bros	Enaville	3	2g	1926-1930
	Harrison	5	1g	1929-1930
	Sandpoint	.42	5g 2r	1907-1931
Humbird L Co	Pierce	12		(1953)
Hutchins Bros L Co				1917-
Idaho Block Match Co	Sandpoint			1902-1912
Idaho Northern RR (46) (21)	Nampa	59	2r	
Lake Ry & L Co				
Boise, Nampa & Owyhee				
Ida & Wash Northern RR (11)	Coeur d'Alene	113	14	1907-1916

Name	Location	Mile-age	Loco-motives	Dates
Ida White Pine Milling Co	Nampa			(1912)
Inland Empire Paper Co	Athol	15	1g 2r	1916-1934
N C Jones T Co	Cambridge	20		(1947)
T H Kerr	Kellogg	10		1925-
Kootenai Lg & RR Co	Harrison	5	1g	1908-1916
(Lane L Co)				
Lewiston L Co	Orofino	6	1g	1908-
MacGillis-Gibbs L Co	Clark Fork	4		(1911-1913)
McGoldrick L Co	Benewah Cnty	35	3g 1r	1905-1946
Mechem L Co	Soda Springs	4	1	1951-1955
Milwaukee Land Co	St Joe	9	2g	1913-1920
Shoshone & Clearwater Ry	St Maries	3		1917-1920
Milwaukee L Co	St Maries	36	4g 1r	1911-1928
Alder Creek RR Co	St Maries	8		1913-(1920)
St Maries L Co	St Maries	7	2g	1913-1923
Marble Creek Valley RR	St Maries	25		1915-
Coeur d'Alene L Co	Coeur d'Alene	1		(1916)-1920
Mountain L Co	Wallace	11	1g	1926-1930
Norida Land & T Co	Sandpoint		2	1935-1938
Ohio Match Co	Coeur d'Alene	48	2g 2r	1921-1945
Panhandle L Co (1)	Spirit Lake	30	2g 1r	1909-1939
Post Falls L & Mfg Co	Coeur d'Alene			(1912, 1915)
POTLATCH FORESTS, INC	Headquarters	99	19	1931-present
Potlatch L Co	Potlatch	96	8g 2r	1907-1931
Rupp-Holland Lg Co	Coeur d'Alene	8	1g	(1917)-1929
Edward Rutledge T Co	Coeur d'Alene	15	6g	1916-1931
Elk Basin & Marble Creek RR	Bovill			1919-1931
Clearwater T Co	Orofino	30	5g	1927-1931
Western States L Co	Caribell	8		-1918
Federal Match Corp	Pierce	4	1g	-1927
V C Potter	Kooskia	7		1937-1947
Rawson-Works L Co	Kamiah	3	1g	1913-1921
Rogers L Co	St Maries	3	3	1931-1942
L J Root	Grangeville	2		(1910)
Russell & Pugh (1) (2)	Harrison	6	1g	1904-1930
Smith Creek L Co	Prairie	44		1934-1947
G R Smith L Co	Kilgore	10		1951-1953
Strobel & Grimm	Lane	6	1g	1907-
WASHINGTON, IDAHO & MONTANA RY CO	Potlatch	67	3g 3r	1906-present
(Potlatch Forests, Inc)				1931-present
(Potlatch L Co)				1906-1931
A C White L Co	Sandpoint	15	2g 1r	1909-1930
Winton L Co	Coeur d'Alene	29	6g	1918-1940
Stack-Gibbs L Co	Coeur d'Alene			1914-1918
Winton-Rosenberry Co	St Joe	8	2g	1920-1923
Rose Lake L Co	Cataldo	8	1g	(1910)-1923
Hoo Hoo RR	Cataldo	5		(1912)
Hoo Hoo L Co	Cataldo	9	1r	(1906, 1912)

NOTES

- 1 — not in continuous operation
- 2 — originally narrow gauge and later standardized
- 3 — pole road
- 4 — wood rail
- 5 — tram road
- 6 — originally horse-drawn
- 7 — both narrow and standard gauge
- 8 — electric road
- 9 — never in operation
- 10 — acquired by Southern Pacific
- 11 — acquired by Milwaukee Road
- 12 — acquired by Northern Pacific
- 13 — acquired by Spokane, Portland & Seattle
- 14 — acquired by Great Northern
- 15 — acquired by Western Pacific
- 16 — acquired by San Francisco & Northwestern
- 17 — acquired by GN and NP
- 18 — acquired by Portland, Eugene & Eastern Ry
- 19 — acquired by SP and GN in 1928
- 20 — acquired by Bellingham & Northern (Milwaukee Road)
- 21 — acquired by Oregon Short Line
- 22 — owned by Southern Pacific
- 23 — equipment of Bayside L Co
- 24 — sold to Pacific Gas & Electric Co
- 25 — later Caldor L Co
- 26 — became San Francisco & North Pacific Ry in 1898
- 27 — leased line from Chico & Northern RR Co
- 28 — repurchased by Cottonova L Co in 1911
- 29 — leased HB&T from E&KR 1904-1907; and from NWP 1907-1911
- 30 — sold to Western Pacific in 1921
- 31 — built by Dolbeer & Carson for horse-drawn cars in 1875
- 32 — sold to Siskiyou Electric Power & Light Co
- 33 — bought by Long-Bell L Co in 1905
- 34 — sold by Weed L Co and became California & Northwestern
- 35 — sold to Redwood Paper & Pulp Co
- 36 — subsidiary of North Pacific Coast, both of which were taken over by North Shore RR in 1902
- 37 — became a division of Pickering L Corp in 1925
- 38 — sold by Terry L Co to Red River L Co in 1920
- 39 — leased to Big Basin Lg Co and later to Klement & Kennedy
- 40 — acquired by GN and NP
- 41 — leased to Sunset Lg Co in 1908
- 42 — owned by Blodgett Co and Crossett Western Co
- 43 — converted threshing machine locomotive
- 44 — began in 1908 under GN control
- 45 — E C Olson contractor 1927-1931
- 46 — operated under contract by Idaho & Washington Northern
- 47 — separate operation from Blanchard RR
- 48 — NP, UP, GN and Milwaukee Road each owned 16 per cent of stock
- 49 — jointly owned by Crown Zellerbach and Pabco Products
- 50 — gravity road without power
- 51 — incorporated as a Weyerhaeuser affiliate in 1910
- 52 — home-made locomotive with eight-foot gauge
- 53 — bought by NP in 1901
- 54 — sold to Laramie, North Park & Western RR Co

INDEX

- Aasen, John, 39
 Abandonment, 128
 Accidents, 40, 59, 65, 66, 111-121
 Ainsworth & Simpson Lumber Co., 129
 Albion Lumber Co., 52, 68, 89
 Allen-Nolte Logging Co., 128
 Alley, J., Co., 74
 Ambulance car, 115
 American Riv Land & Lumber Co., 64
 Anaconda Copper Mining Co., 114
 Apache Ry, 31
 Arapahoe, Jefferson & South Pk Ry, 12
 Arcata & Mad River RR, 22, 48, 68, 69, 116
 Arcata Transportation Co., 63
 Arnold, A. W., Autorail System, 63
 Ballast, 63, 67
 Barney & Smith Car Co., 80
 Bell, R. A., 123
 Bellingham Bay & British Columbia RR, 29
 Bloedel-Donovan Lumber Mills, 29, 84
 Boise-Payette Lumber Co., 72
 Booth-Kelly Lumber Co., Mallet, 77, 90
 Bridges, 14, 47, 54, 55
 Brookings Lumber Co., 128
 Bunk cars, 72, 97
 Cady Lumber Corp., labor, 52, 83
 California & Northern RR Co., 25
 California & Northeastern RR, 28
 California & Oregon Coast RR, 31
 California Barrel Co., 59
 California Industrial Accident Commission, 65, 121
 California Institute of Technology, 123
 California Lumber Co., 88
 California Safety Commission, 121
 California, Shasta & Eastern RR, 128
 California Western RR, 30, 32, 47, 49, 84, 115
 Cameron Logging Co., 51
 Cameron Lumber Co., 83
 Camp, C. E., 30
 Camp Grisdale, 124
 Camp McDonald, 99, 102
 Campbell & Swigert, 39
 Canyon Lumber Co., 112, 113
 Car line, described, 114
 Carnes and Agerter, 74, 78
 Cars, camp, 96-99, 129
 fuel, 89
 incline, 58
 log, 34-36, 61
 passenger, 25, 31
 pole road, 17
 water, 106
 Carson-Tahoe Lumber & Fluming Co., 51, 85
 "Casey Jones," nickname, 112
 Caspar & Hare Creek RR, 30
 Caspar Lumber Co., 15, 49, 64
 Caspar, South Fork & Eastern Ry, 40, 47, 128
 Central Pacific RR, 11
 Century of Progress Exposition, 129
 Chambers Lumber Co., 71
 Charcoal briquettes, 84
 Cherry-pickers, 114, 120
 Cherry Valley Logging Co., 96, 116
 Chico & Northern RR Co., 28
 Chinese, 48, 50, 52, 117
 Clallam County RR, 112
 Clark, Weavers, 129
 Clearwater Timber Co., 67, 126
 Clemons Logging Co., 56-109, 126
 Cleveland tractors, 52
 Clio Lumber Co., 109
 Clover Valley Lumber Co., 115
 Coal, fuel, 84
 Coggins brothers, 49
 Coke, fuel, 84
 Collins, E. S., 115
 Colorado, Utah & Western RR, 31
 Columbia & Nehalem River RR, 31, 50
 Columbia River & Ore Timberman, 51
 Columbia River Belt Line Ry, 77, 88
 Colvin, Henry, 80
 Colwell, George L., 11
 Congress, U.S., 29
 Conlough Co., 115.
 Consolidation-type locomotives, 73, 129, 131
 Construction, 29, 51-54, 63, 66
 Consumnes River, 57, 130
 Control board, 118
 Cookhouse, 98, 115
 Coos Bay, Roseburg & Eastern RR, 31
 Costs, 124
 construction, 29, 47, 51, 53, 54, 66
 incline, 59
 locomotives, 71, 75, 81, 124
 logging, 73, 74, 127
 fuel, 81, 84
 truck, 125
 Counterweight, 118
 Couplings, 120, 121
 Cowlitz, Chehalis & Cascade Ry, 32, 114, 128, 129
 Craig Mountain Lumber Co., 126
 Craig Mountain Ry, 89, 131
 Crews, minimum, 83, 121
 Crosby, Lloyd, 26
 Crown Willamette Paper Co., 66
 Cruiser's report, 43
 Crummys, 66, 72, 99, 100, 101, 120, 129
 Curtiss Lumber Co., 51
 Curves, 49-51, 77
 Daily Colorado Tribune, 12
 Danaher, C. D., Pine Co., 107, 120
 Day, Robert, 129
 Deary, Bill, 114
 Decline railroads, 57
 Deep River Timber Co., 129, 135
 Del Norte Humboldt RR, 26
 Dempsey Lumber Co., 115
 Denver Pacific RR, 11
 Depression, 63, 83, 123, 125
 Derailments, 111, 114, 117
 Diamond & Caldor Ry, 69, 121, 130
 Diamond Match Co., 28, 57, 59, 67, 69
 Diesel, Rudolf, 125, 131
 Dining cars, 98
 Dispatchers, 113, 118
 Dodge, E. J., Lumber Co., 48
 Dolbeer & Carson Lumber Co., 25, 86
 Dolbeer, John, 15, 86
 Dollar Lumber Co., 129
 Donkey engine, 16, 34, 36, 37, 46
 advent, 14
 derailments, 114
 gypsy, 86
 inventor, 15
 roader, 15
 Donovan, J. J., 41
 Dooley, Ed, 113
 Dotterer, J. H., 80
 Doubling, 51
 Duncan's Mills, Calif., 66
 Duncan's Mills Land & Lumber Co., 63, 68
 Dunkirk Engineering Works, 79
 Durham, Conductor, 112
 Dynamite, 117, 120
 Eastern & Western Lumber Co., 69
 Eel River & Eureka RR, 84
 El Dorado County Fair, 130
 El Dorado Lumber Co., 81
 Elevation, 51
 Elk, accident, 116
 Elk River Lumber Co., 22
 Engineers, 82, 119, 111
 crummy, 121
 Diesel, 125
 logging, 41-43
 safety, 121
 Engines, logging, 16
 Eureka & Freshwater Ry, 26
 Eureka & Klamath River RR, 25, 26
 Evans, Albert, 112
 Everett & Monte Crisco RR, 23, 48, 113, 115, 121
 Excelsior Redwood Co., 17
 Falk, Noah, 12
 Feather River Highway, 128
 Feather River Lumber Co., 36
 Feather River Ry, 33
 Filion Bros., 124
 Fire, 72, 81, 106-110, 128, 130
 Fireman, 125
 Flashing, trestle, 110
 Fleming, A. H., 123
 Ford, Model T, 33, 63, 114
 Forest Service, U.S., 29
 Foresters, 126, 131
 Forestry, 126
 Forks Logging Co., 51
 Fourth of July, 27
 Fowler, James, 51
 Freight rates, 24, 30
 Freydis, P. E., 67
 Frogs, described, 114, 141
 Fruit Growers Supply Co., tender, 103
 Fuel, 81, 82, 84
 consumption, 125
 costs, 84, 125
 Galbraith Bros. Logging Co., 58
 Garbutt, T. W., 80
 Gauges, track, 19, 67-69
 Georgia-Pacific Corp., 33, 131
 Gin poles, 15
 Glacier RR, 32
 Goodyear Redwood Co., 72
 Gould, Jay, 28
 Gorghum Co., 64
 Grade, 47, 51, 57, 61, 75, 77, 80, 125
 Grants Pass & Eureka RR, 27
 Great Northern Ry, 21, 31, 29
 Great Southern RR, 31
 Great Southwestern RR, 31
 Greeley, Chief Forester, 29
 Greenlaw Lumber Co., 36
 Grubb, Frank, 113
 Gualala Mill Co., 12, 69
 Gualala River Ry, 68, 83
 Haggmark, Gus, 129
 Hallack & Howard, 51
 Hammond-Tillamook Lumber Co., 47
 Hammond Lumber Co., 52, 130
 Hammond Redwood Co., 59
 Harbor Plywood Corp., 131
 Harper's News Monthly Magazine, 31
 Harriman, E. H., 28
 Harris Creek Lumber Co., 124
 Hartford Eastern Ry, 50
 Hawthorne, W. R., 69
 Herrick, Fred (Lumber Co.), 29
 Hetch Hetchy & Yosemite Valley RR, 31
 High Point Mill Co., 58
 High wheels, 36
 Hill, C. W., 24
 Hill, J. J., 28
 Hindus, labor, 52
 Hines, Edward, Lumber Co., 29
 Hobart (Estate Co.) Mills, 83, 129
 Hobbs, Wall & Co., 120
 Hoo Hoo RR, 32
 Hopkins, Oscar, 79
 Horton Lumber & Timber Co., 63
 Houghton, J., Logging Co., 52

Humboldt Bay & Mad River RR, 12, 26
 Humboldt Redwood Association, 126
 Humboldt Times, 11
 Humpbacks, description, 114, 141
 Hunters, 117
 Huntington, H. E., 26
 Incline railroads, 49, 57, 59, 61
 Indian Valley RR, 32
 Indians, 31, 32, 51, 52, 117
 Industrial accident funds, 111
 Intermountain Ry, 128
 International Paper Co., 133
 International Ry of Canada, 71
 International Rys of Central America, 90, 127
 International Workers of the World, 117
 Interstate Commerce Commission, 24, 84
 Irving, Joe, 24
 Isthmus Ry, 18
 Italians, labor, 52
 Jacks, hand-operated, 15, 17, 34, 44, 114
 Jackson Logging RR, 69
 James, Dave, 84
 Jammer, sliding, 37
 Japanese, labor, 52
 Jillpoke, 72, 114
 Johnson, C. D., Lumber Co., 113
 Kaweah & Giant Forest RR, 32
 Keaton, Buster, 119
 Kelly-Springfield truck, 124
 Keno RR, 32
 Kent Lumber Co., 84
 Kerry, A. S., 50
 Klamath Lake RR, 28
 Klickitat Log & Lumber Co., 131, 132
 Klickitat Northern RR, 32
 Kootenai RR, 31
 Labor, 51, 52
 Laird & Garrett, 58
 Lake Tahoe Ry & Transp'tn Co., 72, 85
 Lake Valley RR, 63, 116
 Lamb-Davis Lumber Co., 42
 Lamm Lumber Co., 42, 123
 La Moine Lumber & Trading Co., 35, 36, 108
 Landings, 14
 Laws, fire, 106
 safety, 116, 121
 Leudinghaus Brothers, 23, 24
 Lewis & Clark Exposition, 76
 Lewis brothers, 23
 Lewis County superior court, 24
 Lidgerwood, 37, 48, 49
 Lightning, fatal, 116
 Lima Locomotive Works, 75, 76, 87
 Linberg Brothers, 116
 Lindstrom, Oscar, 124
 Little Skookum & Chehalis RR, 32
 Livestock, 116
 Loaders, log, 35-37
 Locomotives, 6, 7, 71-85, 123-131
 American-GE, 93
 American-type, 17, 83, 85
 American, 80, 81, 88
 "Ant, The," 127
 Articulated, 77, 90
 Baldwin, 6, 7, 13, 17, 20, 26, 40, 64, 76-78, 81, 85, 89, 90, 92, 119, 132
 "Betsy," 109
 "Betsy Jane," 113
 Blackman, 74, 81
 Brooks, 79, 131
 Climax, 35, 66, 75, 77, 79, 81, 82, 85, 115, 131
 comparisons, 75, 80, 81, 125
 compound, 77
 Consolidation-type, 73, 129
 converted tractor, 82, 84
 converted truck, 83
 Cooke, 131
 costs, 71, 75, 81, 124
 Davenport, 63, 78, 81
 Diesel, 83, 84, 91, 93, 125
 Dunkirk Engineering Works, 79
 electric, 82, 91
 exhibit, 129, 130
 fireless, 78, 90
 Forney-type, 71, 78
 Fouts Grip Wheel, 81
 fuel, 81, 82, 84
 "Galloping Goose," 71
 gasoline, 83, 84, 92
 "General, The," 119
 Gilbert-designed, 79
 gypsy, 86, 92
 Heisler, 75, 76, 78, 82, 84, 85, 91, 92
 Hinckley & Co., 39
 kerosene, 82
 largest, 85, 93
 Mallet, 77, 85, 89, 90, 93, 136
 Mikado-type, 78, 80, 132, 136
 Milwaukee, 83
 Minarets-type, 80, 81, 88
 Mogul-type, 73
 names, 72, 73
 National, 39
 "Minnetonka," 127, 129
 oil, 84
 "Old Betsy," 129
 Pacific-type, 73
 pole road, 80, 82
 Plymouth, 83, 92
 "Polly Ann," 119
 Porter, 75, 78, 88, 90
 Prairie-type, 92, 136
 Rhode Island, 14
 Rogers, 102
 saddle-tank, 88
 Schnectady, 131
 Sequoia-type, 76, 92
 Shay, 33, 73, 75, 77, 78, 81, 82, 85, 87, 115, 121, 122, 131-133, 136
 side-tank, 89
 "Sir Hugh," 71
 Smith & Porter, 127, 129
 Steam Missionary, 80
 "Tollie," 76
 Union Iron Works, 73, 83
 Vulcan, 76, 80, 129
 Walking Dudley, 81
 Westminster Iron Works, 82
 "C. F. White," 124
 Willamette Shay, 78, 82
 Logs, loading, 14, 15, 34-37
 floating, 42
 Loggie, J. J., 24, 25
 Logging engineers, 41-43
 Loma Prieta Lumber Co., 48, 72
 Loma Prieta RR, 113
 Long-Bell Lumber Co., 21, 106, 117, 123, 133
 Long, George S., 21
 Long, R. A., 123
 Longview, Portland & Northern Ry, 21, 131
 Loraine Valley Lumber Co., 129
 Lyle-McNeil & Co., 58
 Lyons, Pat, 114
 M. C. B. automatic coupler, 121
 Madera Flume & Trading Co., 108
 Madera Sugar Pine Co., 83
 Malheur RR, 29
 Marysville & Northern RR, 57
 Mallet, Anatole, 77
 Martin, Frank, 71
 Martin Lumber Co., H. H., 71
 Mason County Central RR, 85
 Mason County Logging Co., 31
 Masten, C. C., 20, 63, 69
 Mattole Lumber Co., 129
 May Creek Logging Co., 115
 McCleary, Henry, 32, 124
 McCloud River Lumber Co., 28, 72, 100
 McCloud River RR, 28, 136
 McCormick, Charles R., Lumber Co., 48, 67
 McCormick Lumber Co., 71
 McDonald & Vaughan, 111
 McGiffert loader, 36, 130, 141
 McGoldrick Lumber Co., 81
 McKay Lumber Co., 69
 McKeen car, 100
 Medford Corp., 28, 130, 132
 Mendocino Lumber Co., 51
 Mendocino RR, 88
 Merced River, 57
 Merrill & Ring Logging Co., 83, 126
 Meskill & Columbia River Ry, 24
 Meskill Lumber Co., 23
 Michigan, early railroads in, 11
 Middle Park Lumber Co., 121
 Millett & McKay, 69
 Millionaire's Special, 118
 Milwaukee Lumber Co., 70
 Milwaukee Road, The (CMStP&PRR), 29
 Minarets & Western RR, 31, 80
 Minnesota & St. Louis RR, 64
 Modoc Lumber Co., 36
 Montana, first railroad, 14
 Morrow, Charles, 129, 135
 Mt. Baker Highway, 128
 Morrison Mill Co., 121
 Murray, Tom, 101
 Mutual Lumber Co., 81
 National Safety Council, 210
 Narrow Gauge Railways in America, 63
 Navajo Southern RR, 31
 Negroes, labor, 52
 Neils, J., Lumber Co., 100
 Nevada State Museum, 85
 New and Lateral House of Israel, 117
 Newskamp's RR, 69
 Nichols, Jim, 17
 Nielson, Fred, 112
 Norby track layer, 72
 Nordhoff, Charles, 31
 North Bend Logging Co., 118
 North Bend Timber Co., 48
 North Pacific Coast RR, 13, 51, 85
 Northern Pacific Ry, 21, 31, 128, 129, 131
 Northern Redwood Lumber Co., 59, 69
 Noyo & Pudding Creek RR, 32, 53
 O. K. RR, 32
 O'Connor, C., 129
 Occidental Mill Co., 24, 126
 Occupations, dangerous, 111, 121
 Olson, E. C., 83
 Olympia & Mt. Rainier RR, 69
 Olympia, Sherman Valley & Grays Harbor RR & Lumber Co., 31
 Olympic Peninsula, 26, 50, 53, 70, 130
 Oregon & Eureka RR, 50, 86, 113
 Oregon & Northwestern RR, 29
 Oregon & Southeastern RR, 30, 119
 Oregon-American Lumber Co., 129, 133
 Oregon Lumber Co., 115
 Oregon, Pacific & Eastern Ry, 27, 112
 Oregon Southern RR, 14
 Oregon workmen's compensation, 121
 Ormsbee, H. N., 42
 Ostrander Ry & Timber Co., 115
 Overpasses, 21
 Oxen, 11, 14, 49, 68
 Pacific Coast Wood & Iron, 24
 Pacific Eastern RR, 28
 Pacific Great Western Ry, 28
 Pacific Logging Congress, 21, 26, 41, 49, 65, 71, 78
 Pacific Lumber Co., The, 12, 25, 36, 47, 59, 61, 78, 102
 Pacific States Lumber Co., 47-53
 Palmer, George, Lumber Co., 51
 Parbuckling, 35, 72
 Passengers, 14, 30
 Passes, courtesy, 23, 30
 Pearce & Balch mill, 124
 Pelton-Armstrong Logging Co., 64
 Peninsular Ry, 54, 77, 116

Pennsylvania RR, 30
 Petroleum, fuel, 84
 Piling, 47
 Pioneer Box Co., 129
 Ping Pong RR, 32
 Piute Indians, 51
 Pokegama Sugar Pine Lumber Co., 75
 Pole roads, 17, 63, 66, 68, 75, 80, 81
 Polk Operating Co., 84
 Polson Logging Co., 76, 93, 103, 111, 128, 129
Poor's Manual of Railroads, 30, 69
 Port Angeles & Western Ry, 128
 Port Blakely Mill Co., 129
 Port Crescent Timber Transportation Co., 24
 Porter-Carstens Logging Co., 57
 Potlatch Lumber Co., 21, 37, 105, 114
 "Potlatcher, The," combination car, 129
 Powers, A. J., 49, 64, 66
 Prosper Mill Co., 39
 Puget Sound & Baker River Ry, 112
 Puget Sound & Grays Harbor RR, 116
 Puget Sound Ry Historical Assn., 129
 Puyallup Valley Lumber Co., 82
 Radio communications, 118
 Rail, cost, 63, 64
 curvature, 51
 expansion, 65
 gauges, 63, 69, 82
 guard, 66
 iron, 64
 leasing, 21, 65
 relay, 45, 64, 141
 slippery, 111, 114
 straightening, 66
 strap, 63
 street car, 64
 third, 69, 70
 weight, 65
 wood, 20, 63, 74, 75, 79, 81
 Railroad Fair, 129
 Railroads, electric, 81, 82
 mileage, 123, 127
 names, 31-32
 Railway & Locomotive Historical Society, 20
 Railway Equipment Co., 131
 Rayonier, Inc., 93, 103, 130, 131
 Red River Lumber Co., 82, 84, 93, 102, 105, 106, 123, 125
 Red River RR, 32, 82, 100
 Resistance, grade, 51
 Rhode Island locomotives, 14
 Richardsons, 69
 Right of way, 21-29, 42, 128
 Rim of the World Drive, 128
 "Ring of Fire," movie, 131
 Roach Timber Co., 57, 59
 Robertson, D. A., 47
 Rockefeller interests, 121
 Rocky Mountain Ry, 23, 128
 Rogue River Valley Ry, 129
 Rollway, 14
 Row River, 119
 Royce Lumber Co., 119
 Rule G, 119
 Russian River Land & Lumber Co., 85
 Ryan, Walter, 48, 65
 Sabotage, 117
 Safety, 50, 59, 65, 112, 113, 121
 Saginaw & Manistee Lumber Co., 68
 Saginaw Timber Co., 52, 57
 St. Helens tree farm, 100
 St. Joe National Forest, 70
 St. Patrick's Day, 113
 St. Paul & Tacoma Lumber Co., 100
 Saldern Logging Co., 51
 San Bernardino Mountains, 128
 San Francisco & North Pacific RR, 23, 47
 Santa Cruz & Watsonville RR, 113
 Santa Cruz Beach RR, 72
 Santa Fe RR, 21, 129
 Satsop RR, 124
 Sawmill, portable, 21, 67
 Scandinavians, 51
 Schafer, Albert, 118
 Peter, 118
 Schafer Bros. Logging Co., 21, 52, 103, 118, 123, 131
 Scrap, 124, 127, 129, 131
 Seattle, Lakeshore & Eastern RR, 116
 Seattle Logging Co., 116
 Seattle Steel Co., 64
 Sessoms' lowering car, 61
 Shamrock & Western Ry, 32
 Shay, Ephraim E., 72, 73
 Shevlin-Hixon Lumber Co., 43, 103
 Shoemaker, Paul F., 124
 Shops, repair, 102
Short-Line Railroad, 131
 Shoshone & Clearwater Ry, 31
 Shovel loader, 36
 Sierra Flume & Lumber Co., 73
 Sierra Lumber Co., 69, 111
 Sierra Nevada Wood & Lumber Co. 20, 69, 71
 Sierra Valleys Ry, 25, 218
 Simpson Lumber Co., 16
 Simpson Logging Co., 47, 76, 80, 113, 124
 Simpson, Sol, 117
 Skagit Steel & Iron Works, 82
 Skid roads, 7, 14, 23
 Skookum Ry, 32
 Slides, 112, 115
 Smith & Dougherty, 12
 Smith-Powers Logging Co., 47, 64, 66, 72
 Smith, C. A., Lumber & Manufacturing Co., 52
 Smith, Norman R., 26
 Smith, Ralph L., Lumber Co., 127
 Smoke signals (orders), 118
 Snohomish, Skykomish & Spokane Ry, 31, 64
 Snoqualmie Falls Lumber Co., 37, 97, 134
 Snow, 83, 105, 106
 Somerville, S. S., 47
 Sonoma Lumber Co., 47
 Sorensen, Henry, 129
 South Bay RR, 12
 Southern Pacific RR, 26, 28, 66, 67, 84, 113
 Southwest Lumber Mills, 51, 125
 Spar trees, 36
 Spark arresters, 108, 109, 140, 141
 Speeders, 30, 113, 114
 Spruce Production Division, 50, 52, 53, 112
 Standard Box & Lumber Co., 72
 Standley, Sheriff, 52
 Station, construction, 51
 Steam, 72, 81, 101
 Steam Missionary, 80
 Steamboats, 52, 72
 Stewart, David E., 117
 Stimson, Ulner, 69
 Stoddard Lumber Co., 92
 Storey-Keeler Lumber Co., 79
 Stump ranches, 126
 Sugar Pine Lumber Co., 36, 51, 59, 80, 121, 123
 Sugar Pine Ry, 32
 Sultan Ry & Timber Co., 51
 Sumpter Valley Ry, 25, 30, 51, 52, 77, 84, 90, 115, 127
 Sunday, Billy, 63
 Super Chief, 63
 Swayne Lumber Co., 114
 Switchbacks, 49, 50, 59
 Tacoma Eastern RR, 52
 Tap lines decision, 24, 31
 Ties, 45, 66, 67
 Timber supply, 123, 125, 126
"Timberman, The," 24, 43, 58, 81, 84, 123, 124, 125, 131
 Toll Logging Roads Act, 24
 Track-layers, 65, 72, 83
 Tractors, 52, 82, 84, 85
 Trailer, auto, 124
 Trailer, described, 114, 141
 Tramways, 11, 75
 Tree farms, 56, 126
 Trestles, 13, 40, 47, 48, 56, 66, 109, 110, 115, 128, 134
 Truckee Lumber Co., 85
 Trucks, auto, 83, 85, 124, 125, 126, 131
 Tunnels, 25, 49, 50, 52, 70
 Turntables, 80, 102
 Twin Falls Logging Co., 78, 113
 Uintah Ry, 77
 Union Iron Works, 73, 83
 Union Lumber Co., 52, 67, 84, 115, 126
 Union Pacific RR, 11, 21, 29
 Union Timber Co., 84
 Vance Creek Bridge, 54
 Vance, John, 12
 Vance Lumber Co., 25
 Virginia & Truckee RR, 71
 Walker, Thomas B., 123
 Walking Dudley, 80
 Wallace Lumber & Manufacturing Co., 84
 Warner Bros. Pictures, 20, 129
 Warnick Lumber Co., 57
 Warren Spruce Co., 42, 48, 115
 Washington, Idaho & Montana Ry, 21, 31, 114, 129
 Washington Mill Co., 69
 Washington Pulp & Paper Co., 31
 Washington, State (Territory)
 Legislature, 24
 Safety Board, 137
 safety laws, 116
 supreme court award, 121
 Washington Western RR, 31
 Washouts, 113, 115
 Weed Lumber Co., 28
West Coast Lumberman, 24, 78, 115, 125
West Coast Signal, 12
 West Fork Logging Co., 82
 West Fork Timber Co., 101
 West Oregon Lumber Co., 57, 116
 West Side Flume & Lumber Co., 51, 81
 Western Lumber Co., 82
 Westminster Iron Works, 82
 Wendling-Johnson Lumber Co., 28
 Weyerhaeuser Timber Co., 26, 28, 43, 67, 77, 81, 126, 130, 131
 Wheels, 71, 75, 76, 77, 80, 121
 Whistle signals, 137
 White River Lumber Co., 81, 102, 106
 Whitman Logging Co., 88
 White, L. E., Lumber Co., 13
 Whitney Co., 77
 Willamette Pacific RR, 27, 28
 Wilson & Olson, 83
 Wisconsin Logging & Timber Co., 57, 59
 Withrow, Ira, 84
 Wood-Knight Logging Co., 57
 Workmen's compensation, 121
 Yeon-Pelton Logging Co., 17, 34, 58, 64, 77
 Yeon, John, 57, 58
 Yosemite Lumber Co., 57-59, 61
 Yosemite Valley RR, 30, 57, 61
 Young, William S., 131
 Zuni Mountain RR, 31

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